The Newspaper of Information Systems Management
May 2, 1994, Vol. 28, No. 18, 138 Pages, $6/Copy, $48/Year

COMPUTERWORLD

WHY PROJECTS FAIL. AN EXCLUSIVE USER SURVEY, PAGE 110.

Client/server faces up to enterprise

Corporate customers revisit the classics

By Rosemary Cafasso

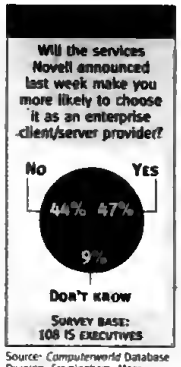
Client/server users are now adopting the classic information systems concept of an architecture to curb ad hoc development and avoid the islands-of-automation problem.

"It's the same thing we went through in the 1980s with minis, no question," said Peter Schay, a vice president at consultancy Gartner Group, Inc. in Stamford, Conn. "The good news is there [are few enough] client/server production systems that it is not too late to do the architecture."

American Airlines, for example, got its start in client/server computing five years ago and is now establishing guidelines that will essentially function as a blueprint for developers.

American has about 50 client/server applications, and some of them were built with tools that are now obsolete, said Meg Lewis, a managing director at the airline's Sabre computing services. Under way for nearly a year, the guidelines are intended to produce a

Corporate, *page 14*



Source: *Computerworld* Database Division, Framingham, Mass.

Desktop leaders vie to meet IS demands

By Elisabeth Horwitt and William Brandel

Novell, Inc. last week joined its PC software rivals in conceding that it needs third-party help to establish itself as a credible client/server player to corporate users.

The company rolled out its Enterprise Solutions Division, which will join high-level systems integrators in advising major accounts on enterprise-level client/server projects. It also formed the Corporate Account Program to provide technology information and direct support to major corporate customers.

Users said Novell's move, like similar efforts in past years by Lotus Development Corp. and Microsoft Corp., is a step in the right direction.

"It's high time that [the big PC software vendors] changed some of their approaches," said David Shepard, chairman and chief executive officer of Fleet Services Corp. "They have not understood what it takes to deploy and support a business application in a corporate en-

Desktop, *page 14*

High-speed networks

Switches hit the fast lane

By Stephen P. Kiett Jr.

Users looking for a more cost-effective way to alleviate congestion in large Ethernet LANs will receive a boost today from SynOptics Communications, Inc.

At Networld/Interop '94 in Las Vegas, the company will unveil a family of switches that will raise the bar for flexibility, manageability, throughput and price among the handful of switches that are currently available.

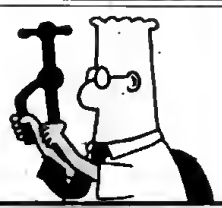
The crown jewel of SynOptics' LattisSwitch 28000 series is a 10M/100M bit/sec. switch based on the 100Base-X specification from the Fast Ethernet Alliance — a vendor consortium formed to extend the existing Ethernet standard to 100M bit/sec. [CW, Nov. 1, 1993]. Each of the $16,950 switch's 16 ports can be configured to support a 10M or 100M bit/sec. dedicated connection or LAN segment, SynOptics officials said.

Scalability

This flexibility is key. It allows users to start with a basic workgroup Ethernet switch that provides dedicated 10M bit/sec. connections between nodes. But it offers them the option of scaling up bandwidth down the road by installing high-speed adapter cards.

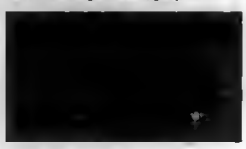
The switch is critical for SynOptics, which has been lagging behind competitors such as Cable-

Switches, *page 16*



THE MAN BEHIND DILBERT

Scott Adams knows what technical staffs are really thinking, and managers better pay attention. *Management, page 98.*



Newspaper
#8XB8JFT********** 5-DIGIT 48103
#UIV7ZE3OOM099039# 0010110668
UNIVERSITY MICROFILMS INT * 0017
UNIVERSITY MICROFILMS INT 0011 6 XC
SERIAL PUBLICATIONS
300 N ZEEB RD
ANN ARBOR MI 48103-1553

Iceberg finally thaws out

Long-delayed storage device ships; some bug fears linger

By Thomas Hoffman

After 2½ years of technical delays and enough product hype to make even P. T. Barnum blush, Storage Technology Corp. has finally made good on its promise to deliver Iceberg, its next-generation, fault-tolerant disk array subsystem.

And despite industry hullabaloo about Iceberg's lengthy microcode problems, prospective users said they are still hot for the storage device.

StorageTek, in addition to sending production microcode to Iceberg beta users, has already shipped 40 units and expects to have 100 machines installed by August, according to financial analysts who were briefed recently by the Lonisville, Colo., vendor.

"We haven't received a definitive statement on when it would be available to us, but we're still interested in purchasing it," said Karl Peter, manager of data center operations at Bankers Trust Co. in Jersey City, N.J.

Iceberg, *page 10*

"Penguins on Ice" is StorageTek's code name for the 100 Iceberg units now in inventory and awaiting delivery. The backlog is 250 units.

Licensing controversy

Industry debates certification

By Mitch Betts

Someday, the software controlling a passenger jet or hospital system will fail, and lives will be lost. Amid gut-wrenching TV reports on the disaster, anchorman Ted Koppel might say, "Tonight on *Nightline*, we'll try to answer the question: 'If plumbers and hairdressers have to be licensed, why not computer programmers?'"

Concern that such a scenario will come to pass in the next decade has prompted professional societies to take action. Several are drafting policies on the highly controversial topics of competency testing and mandatory government licensing for computer professionals. Recommendations from the various task forces are expected next year.

Supporters say licensing will help protect the public from buggy software and incom-

Licensing, *page 26*

IEEE Computer Society's *Robert J. Melford: Should government or industry set policy?*

A PUBLICATION OF IDG

What's Inside

May 2, 1994

GEORGE CASTLE

Creeping requirements can doom a project. Just ask **Terry Marksberry**, *CIO at The Meredith Corp., who tells of one now-defunct system that ballooned to three times its original cost because user requirements kept changing.*

Page

Executive Briefing

Information systems managers planning moves to client/server computing are keeping their eye on the dangers inherent in ad hoc development and islands of automation. As a result, the classic concept of an information architecture carries more appeal for them. Meanwhile, on the vendor side, **Novell** joins the ranks of PC arena vendors, such as **Microsoft**, in pitching client/server consulting services. *Page 1*

A large part of every CIO's job is political campaigning, but to do it successfully is tricky. Voter support can be like a leaking balloon — you have to constantly check its pressure and keep it inflated. *Page 91*

The OSF's Distributed Computing Environment (DCE) is ready for prime time at leading-edge sites, and DCE development is widening. But industry analysts and early users predict it will not be widely used until 1996. *Page 73*

One of the snags in any major corporate move is the impact that a single change in one department or procedure will have on others. The Ithink modeling package can help managers see the downstream effects of changes in the business process. *Page 42*

Professional associations are preparing for the day when politicians call for licensing of computer professionals to protect public safety, but the notion is highly controversial. That call may come in the wake of a systems disaster spawned by buggy software. The debate centers on opponents' claims that licensing IS professionals is a sham, designed to let those who have licenses charge more for their services, as well as on proponents' claims that if hairdressers need licenses, programmers working on lifesaving computer systems should, too. *Page 1*

Even though it suffers from name-recognition applications and bundling deals with hardware vendors, **IBM's OS/2** is apparently still making gains on the desktop. IBM's Personal Software Products group last week spelled out plans for a more efficient version of OS/2 for Windows. *Page 12*

The Networld/Interop '94 show gets under way in Las Vegas this week, with high-speed networking hardware and Ethernet switching takings leading role. One key announcement is expected to be **SynOptics'** introduction of a family of aggressively priced "fast" Ethernet switches. *Page 1, 16 and 20*

The 5th Wave *by* Rich Tennant

NEWS

■ **Microsoft** continues to take heat for what developers consider overly restrictive language in nondisclosure agreements. *Page 4*

■ The latest **shake-up at Digital** means a new sales strategy and could spell trouble for less profitable lines of business. *Page 4*

■ **Computer Associates** will introduce CA-dBFast/400, a GUI client/server development package for the IBM AS/400. *Page 6*

■ **IBM** to launch a campaign to draw **Unix developers** to the AS/400 environment. *Page 6*

■ **Compaq** says it will push into vertical markets to help differentiate itself in the corporate desktop market. *Page 7*

■ **Sun Microsystems** and **Fujitsu** plan to enhance 32- and 64-bit **SPARC chips**. *Page 8*

■ Users deliver a resounding wait-and-see response to **Apple's new servers**. *Page 15*

DESKTOP COMPUTING

■ Sticky **trackballs** are an issue for some users but technologists may have put their finger on the problem. *Page 41*

WORKGROUP COMPUTING

■ Ontos and Versant hope to turn up the volume on what has been a relatively quiet **object-oriented database** market, offering enhanced versions of their products. *Page 51*

ENTERPRISE NETWORKING

■ Large companies are looking for back-end **messaging services** that are more robust than what LAN vendors currently offer. *Page 63*

LARGE SYSTEMS

■ Prompted by its recent decision to insource key operations, Edward D. Jones & Co. has already benefitted from replacing its IBM and Hitachi Data Systems DASD with EMC disk arrays. *Page 73*

APPLICATION DEVELOPMENT

■ Despite vendor commitments to **component-ized architectures**, the timetables for executing their strategies and their definition of plug and play itself are altogether different. *Page 81*

MANAGEMENT

■ Scott Adams' caustic comic strip **Dilbert** has captured the hearts of technical professionals, and management better pay attention. *Page 98*

CAREERS

■ The best preparation for a career in massively **parallel processing** is the same as for open systems and client/server computing — SQL and Unix. *Page 111*

MARKETPLACE

■ Is your **antivirus software** up to par? The National Computer Security Association offers a certification program that puts NetWare products through their paces. *Page 121*

COMMENTARY

■ **Paul Gillin** says the Chicago NDA dispute was fueled by Microsoft's audacity and a lack of backbone in third-party developers. *Page 34*

■ **Charles Babcock** highlights a case in which working with the basic power of Windows brought cash gains. *Page 6*

■ **Esther Dyson** says the way for many software companies to go may be through technology alliances with many companies rather than with one big partner. *Page 35*

■ **Eric Harslem** places the burden on systems vendors to help network managers cope with their challenges. *Page 35*

■ **Jeffrey Henning** says the availability of products like Shapeware's Visio Express can influence user's application suite selection. *Page 41*

■ **Richard Finkelstein** says the parting of the ways of Microsoft and Sybase represents a schism that will divide client/server computing into two camps. *Page 51*

Calendar ..... *Page 102*
Company Index ..... *Page 128*
Editorial/Letters to the editor ..... *Page 34*
Friday Stock Ticker ..... *Page 129*

While Everyone Jumps On The Client/Server Bandwagon, Allow Us To Introduce Something Better.

Client/server alone is not enough.

You need HR expertise as well.

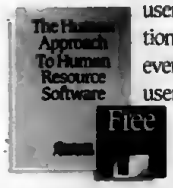
And now there's finally an HR software package that gives both.

Introducing new CA-HRISMA.™

The absolute latest client/server technology. Designed around a solid foundation of HR experience. That's the unprecedented combination that sets new CA-HRISMA apart from other HR software.

It's a completely integrated solution that covers all your payroll, personnel and benefits needs with true client/server, GUI-based software that supports both distributed and centralized processing.

It's flexible. Friendly. And incredibly easy to work with. An abundance of end-user access and customization options will keep everyone from the power user to the beginner smiling.



CA-HRISMA was designed by HR professionals for HR professionals. For over two decades we've helped thousands of clients take care of millions of employees.

Call 1-800-225-5224, Dept. 50102, For A Free Demo Disk And Booklet.

Call today and we'll show you how you can leave that bandwagon far behind.

COMPUTER ASSOCIATES
Software superior by design.

Introducing CA-HRISMA™

THE HUMAN RESOURCE SOFTWARE THAT'S DESIGNED FOR HUMANS

© Computer Associates International, Inc., Islandia, NY 11788-7000. All product names referenced herein are trademarks of their respective companies.

Microsoft retreats on NDAs – a little

By Stuart J. Johnston and Melinda-Carol Ballou

■ Microsoft Corp. has rescinded portions of its stringent Chicago nondisclosure agreement (NDA) for WordPerfect Corp. developers, but it is retaining them for competing systems developers who want to receive the "prebeta" code.

In some cases, the Chicago NDA demanded that the programmers who work on Chicago (also known as Windows 4.0) not work on competing systems technologies for a period of three years [CW, April 25].

In the meantime, developers seeking access to another key Microsoft technology said the NDAs they have received could signal a growing pattern of using such agreements to stifle work on competing technologies.

Those developers were referring to NDAs received last month for Microsoft's Object Linking and Embedding (OLE) Controls Developer's Kit (CDK). The CDK NDAs allow the developers to create OLE controls but appear to prohibit them from writing any tools that would allow end users to build their own OLE controls.

"If I were Symantec, Borland or Watcom, I'd be really upset," said one developer who received the CDK NDA. He added that it seems as if Microsoft wants to foster a cottage industry for OLE controls but does not want to allow the creation of competing tools.

"It's unfair of Microsoft in their position," said Tim Harmon, an analyst at Meta Group, Inc.'s Burlingame, Calif., office. Such a move could leave users with only a single choice for tools that create OLE controls, he added.

Microsoft Senior Vice President Roger Heinen, however, said NDAs such as the one for the OLE CDK are standard practice for prerelease software and that any company with concerns should raise them with Microsoft.

As for the Chicago NDAs, the clash last week was "unfortunate," and at least one feature of the NDA was not a standard requirement in the company's usual NDA, said Bob Kruger, director of strategic relations and standards at Microsoft [CW, April 25].

Two items dropped

That feature, which stipulated the three-year waiting period, was one of two items dropped from the NDA that Microsoft had asked WordPerfect to sign.

The other requirement dropped was an exclusion from the Chicago beta of WordPerfect developers who are working on Component Integration Laboratories' OpenDoc object exchange technology. Microsoft considers OpenDoc a direct competitor of OLE.

The special NDAs went to only two applications developers, Kruger said. WordPerfect, which is porting OpenDoc to Windows and providing code to allow it to interoperate with OLE, was one. The other went to Borland International, Inc., he said.

Other developers who received the special NDAs were vendors of competing operating system technologies, Kruger said. These include Novell, Inc., The Santa Cruz Operation and SunSoft, Inc.

A requirement that the developers who would have access to the beta be listed on the NDA is not unheard of in the industry — a point that several independent software vendors disputed last week — and will not be dropped, Kruger said.

In fact, Sun officials complained about the restrictions because the same people who are working on PC-NFS support for Chicago are also dedicated to Wabi work. The Sun officials said they did not have enough qualified people to have separate teams working on both, which may slow progress toward release of one or both of the technologies.

Still, several developers said last week that the language in the CDK NDA is corroborating evidence, along with the Chicago NDA, of a certain pattern on Microsoft's part.

"It is not news to the industry that Microsoft wants to own the desktop," said David Moon, senior vice president of development at WordPerfect. "What is news is they tried to take advantage of their monopolistic presence to maybe cut some people out."

But Moon added that Microsoft had largely alleviated WordPerfect's concerns by eliminating the offensive clauses in the NDA for Chicago. "We are now able to move forward," he said.

Ed Scannell contributed to this report.

'Noxious' deal

Even as the word went out from Microsoft that it would ship early copies of the OLE CDK last month, some independent developers were saying the nondisclosure agreements accompanying the beta copies were too noxious to sign. An excerpt from the NDA for the OLE CDK reads as follows: RECIPIENT agrees to prohibit any authorized individuals who have had access to the PRODUCT [OLE CDK] from participating in the design and/or development, feedback, or guidance of a RECIPIENT product that is competitive with the PRODUCT [OLE CDK] without Microsoft's express written permission.

Paul Gillin takes issue with the NDA. See page 34.

Digital power shift dispenses latest Rx

By Mary Brandel

Promises were made and power was shifted at Digital Equipment Corp. last week as Enrico Pesatori, head of the PC business unit, took the reins from Edward Lucente, who resigned as vice president of worldwide sales and marketing.

Nevertheless, Digital provided only glimpses of the action it will take to turn the company around.

Enrico Pesatori *acknowledged Digital's need 'to undergo a severe downsizing'*

"I'll be watching, but I don't know if moving people around at this point is going to make any difference," said Robert Cloninger, data processing manager at OK Industries, Inc. in Fort Smith, Ark. "If no one's got an idea of consistency that they can sell through the rest of the company, a couple of personnel changes might not make any difference."

In a letter to stockholders last week, Chief Executive Officer Robert Palmer outlined two actions: Give business units more accountability and direct ownership and focus investments in business segments where Digital can prosper.

Digital executives and industry observers said the company will do the following:

- Make a strong move to sell Alpha systems through indirect channels.
- Cut staff, especially but not solely in sales and marketing.
- Reduce emphasis on nonprofitable product lines.

"Anything that isn't profitable is in danger," said Terry Shannon, analyst at Illuminata in Hollis, N.H.

The promotion of Pesatori, who has experience with high-volume, low-margin business, lends credence to Digital's commitment to sell Alpha through alternative channels, analysts said.

"We are moving rapidly from direct to indirect" with workstations and servers, especially for smaller accounts, Pesatori said in an interview last week.

But analysts said it remains to be seen whether the PC business model is easily transferred to the server business.

Yet analysts were heartened by the work Pesatori has done adapting the PC business unit to market realities. If Pesatori "breaks up internal operational gridlock inside systems marketing and makes each unit independently accountable and can pare down investments, I believe he can restore growth and confidence in the business," said Tom Austin, an analyst at Gartner Group, Inc.

Time for spring cleaning

Before any growth can occur, however, analysts agreed that Digital must put its house in order. Analysts are looking to sales and marketing for the biggest head count loss. Pesatori acknowledged the need "to undergo a severe downsizing," but he stressed that the entire work force is under scrutiny — not just salespeople.

On the product side, the company has already done some of the legwork to eliminate redundancy in its Alpha servers by incorporating a modular product design in its 2100 model, introduced in April. "There are eight different servers available today," Shannon said. "That's cluttered. It would be nice to slim down the Alpha line to something like four."

Digital has already worked to reduce product development expenditures by "aggressively" partnering with other vendors, said William Strecker, chief technology officer.

PALMER'S PITCH

In a shareholder letter, Digital CEO Robert Palmer outlined the following milestones achieved in the last 18 months:

- SENIOR MANAGEMENT AND PERSONNEL REORGANIZED.
- EMPLOYEE POPULATION SIGNIFICANTLY DOWNSIZED.
- A MUCH LEANER AND MORE COST-EFFECTIVE INFRASTRUCTURE.
- ENGINEERING REDUNDANCY GREATLY REDUCED.
- DIGITAL TRANSFORMED FROM A CLOSED AND PROPRIETARY SYSTEMS COMPANY TO AN INDUSTRY LEADER IN OPEN SYSTEMS CLIENT/SERVER COMPUTING.

Corrections

Due to a reporting error, the article "Team drives technology forward" [CW, April 18] stated that the advanced technologies department at SmithKline Beecham PLC reports directly to the senior vice president of information resources. In fact, that department reports to Louis Valente, vice president and director of strategic information technology.

An article in the April 25 issue, "Borland faces uncertain future," incorrectly stated that Borland was expected to lay off 200 more employees in addition to layoffs in Europe. In fact, Borland had already laid off those employees.

of the top 10 'For anies are using Oracle7.

Here's what our customers are saying about Oracle7:

"It's the driving force behind our most sophisticated applications."
"You can't break it, it just keeps running and running."
"It's the best Client/Server solution out there."
"We needed a truly open solution: Oracle7 is it."

To find out more about why companies of all sizes are choosing Oracle7, call us. We'll send you in-depth analysis from IDC and Aberdeen, and you'll see for yourself why everyone is so excited. 1-800-633-1071 Ext.8120

ORACLE

©1993 Oracle Corporation Fortune is a trademark of Time Inc.

'How To' update the folklore system

Windows will improve in Microsoft's Chicago version, which will better integrate the user interface and resolve reliability issues that have dogged it since its inception. But in case you haven't noticed, application developers in the business world aren't waiting for the improvements. They have gone ahead and built sophisticated business applications, sometimes realizing dramatic gains as a result of this common denominator technology.

Take Brian Westcott's firm, Westt, Inc. in Menlo Park, Calif.

Westt is a custom manufacturer of electronic subassemblies for Silicon Valley semiconductor firms and users of finely calibrated electro/mechanical devices. Westt is typically called on to produce wafer handling devices for a chip fabrication line. The firm machines 70 parts of a 500-part piece and then assembles the total.

Assembly workers might produce six units in a week, then not fill another order for a month. Consequently, the need for manufacturing documentation — blueprints, exploded three-dimensional drawings, parts and tool lists, etc. — is particularly acute.

At the same time, this need often goes unmet. Parts are recast and assembly sequences changed as outside designers try to iron out kinks.

How To shows how Windows can boost productivity and quality in a real-world, time-sensitive setting.

Charles Babcock

"The paper system was always out of date," Westcott said recently in an interview. In fact, assembly techniques rested on the back of what Westcott calls "the folklore system."

A skilled assembler would learn from experience, sharing hard-won knowledge with a co-worker and speeding the production process. But, as Westcott noted, the only problem is, "It's only as good as who is talking to whom on a given day."

A year-and-a-half ago, Tom Stepien, the head of Westt's in-house computer-integrated manufacturing consultants, began working on a Windows system to put manufacturing documentation online. Using Gupta's SQLWindows and SQLBase 5.1, and Microsoft's Visual Basic, Stepien built How To, a Windows application that coordinates images of subassemblies with a menu bar that lets workers call up a list of parts or tools needed or an exploded drawing of how the parts fit together, along with instructions. Blueprint and drawing updates are scanned into the system and are available to everyone on the Novell NetWare LAN.

A "Standards" menu item allows a worker to check known recommendations, such as the measure of solder for a joint or how much a fastener should be tightened. Video sequences illustrating a production step are added using Westt's own videocamera plugged into a VGA board in the PC. The image is edited with tools from Computer Presentations Image Prep.

The system also allows skilled assemblers to annotate the diagrams, offering advice based on their experience. "The new set of laser fittings have a lot of burrs. Don't use them. Use those from lot #6347 instead," one worker commented.

The system, running on a $2,300 486 PC "captures the knowledge base in the company," Westcott noted. The server PC is on a NetWare LAN and can be accessed by three PCs on the factory floor.

After the start-up of How To, which cost $23,490 to implement, workers switched between jobs more easily and spent less time redoing work. First-year savings totaled $17,296 through the reduction of overtime and increased productivity, Westcott said.

The capture of corrections and sound assembly techniques has increased product reliability and decreased the field defect rate, Westcott said. He noted the defect rate fell from 1.5 per unit to 0.34 per unit, leading to another $11,600 savings.

Westt's How To application shows just how much the elemental power of Windows can boost productivity and quality in a real-world setting. You may not want the production process itself to be carried by Windows, but it can certainly help.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737

IBM aims to open AS/400 . . .

By Craig Stedman

■ IBM this week will begin its campaign to lure Unix software vendors to support the AS/400 line, its highly profitable family of business computers that are still saddled with a proprietary systems image.

As part of its latest AS/400 rollout, IBM this week will introduce an OS/400 release that includes Unix features such as an ANSI standard C compiler, the Posix file system, sockets and threads, analysts said.

The computer giant hopes to transform the AS/400's image by building more than half of the Spec 1170 Unix application programming interfaces (API) into the OS/400 operating system during the next two years, according to analysts familiar with IBM's plans.

That should make it easier to port Unix code to the AS/400, opening the door for developers of client/server tools and applications to move their software to the system, analysts agreed. AS/400 users stand to benefit from having a wider selection of graphical user interface-based tools to choose from as well.

Unix vendors "have had to do unnatural acts" to port to the AS/400 until now, said David Peterson, a former AS/400 Division executive who is president of Midrange Open Business Strategies, Inc., a consultancy in Rochester, Minn. He added, however, that the OS/400 changes "make it just your ordinary, friendly C environment," and customers should see "more and better tools and applications" as a result.

Big plans

OS/400 Version 3 Release 1 and a follow-on due in 1995 are also expected to boost the number of Spec 1170 APIs supported by the operating system from about 200 to at least 650, said Bob Djurdjevic, president of Annex Research, Inc. in Phoenix. Between 65% and 85% of the most important APIs should be incorporated into the operating system this year, he added.

Donald Miller, chief information officer at International Game Technology in Reno, Nev., said IBM's Spec 1170 plans sound promising. "If I can get the AS/400 to look more like an open system, that's wonderful," Miller said, noting that he has no interest in moving to Unix for at least three years.

Miller added, though, that IBM's client/server promises for the AS/400 have not yet come to fruition. "You can put in multiple peer-level AS/400s, but everything is still drawn off what I refer to as the mothership," he said.

. . . as development tool debuts

By Thomas Hoffman

Computer Associates International, Inc. will attempt to plug a hole in the ever-changing IBM AS/400 market this week when the Islandia, N.Y., software giant introduces CA-dBFast/400. The client/server development package, with its Windows-based graphical user interface (GUI), was designed to enable users to share AS/400 data between the midrange platform and desktop environments.

Originally conceived as a stand-alone mid-size hub, the AS/400 has slowly evolved to act more as an enterprise server in two- and three-tiered corporate computing architectures, according to users and analysts. IBM will tout the AS/400's improved interoperability tomorrow as part of its largest AS/400 product rollout since the machines were introduced in 1988.

CA-dBFast/400 should be heartily received because of the dearth of AS/400 application development tools on the market, users said.

"We're getting ready to front-end our AS/400 to an [IBM] OS/2 LAN for client/server development, so there's definitely some interest in" CA-dBFast/400, said Brian Nichols, manager of management services at Kay Wholesale Drug Co. in Wilkes-Barre, Pa.

Looking good

The development tool set, which fully supports Microsoft Corp.'s Dynamic Data Exchange and Dynamic Link Libraries, can execute program logic on both the AS/400 and PCs running Windows. The product uses IBM's AS/400 PC Support module to communicate between AS/400 hosts and desktop clients.

CA product developers had been using the vendor's CA-dBFast development suite to create new modules for its AS/400 packages, such as manufacturing product CA-PRMS, said Marc Sokol, CA's director of product strategy.

Early CA-dBFast/400 users have not used the tool kit long enough to discuss its performance, but they remained upbeat about its potential.

"We've only been using it for about a month, but already we feel it will be a useful GUI tool for our users to create their own applications and not have to rely on MIS so often" for application development, said Krish Kumar, MIS manager at Medex, Inc., a Hilliard, Ohio, manufacturer of medical care products and an IBM AS/400 Model F50 shop.

Van Camp's Boyles: *CA's new AS/400 tool will have synergy with CA-PRMS*

Seeking portability

"What we're looking for — and what we think we've found — is a tool that will give us some portability between the desktops and the AS/400," said Greg Reischlein, MIS manager at BW/IP International, a Temecula, Calif., manufacturer of mechanical seals. He has been testing CA-dBFast/400 since last month.

Van Camp Seafood Co. took a brief look at a demo copy of Microsoft's SQL Windows but decided to beta test CA-dBFast/400. The canned seafood producer foresees strong synergy between the application development tool and its CA-PRMS manufacturing suite, said Jack Boyles, director of MIS at the San Diego-based firm. "CA-dBFast/400 should fit in neatly with our PRMS file definitions," he explained.

Currently in beta testing, CA-dBFast/400 should begin shipping by mid-July priced at $795 per developer's copy, with a one-time $2,000 charge for the AS/400 connection.

Compaq revamps for corporate users

Customer feedback key to product differentiation

By Jaikumar Vijayan
and Michael Fitzgerald
HOUSTON

Compaq Computer Corp. is concerned that its booming consumer business may distract the company from its core corporate customers, which could lead to longer-term problems.

So Compaq recently said it has revamped its sales organization, creating a separate group for its 800 major accounts. The vendor also unveiled a vertical market strategy designed to better serve corporations.

Compaq said it will separately target vertical industries through a series of seminars that will bring together information systems managers from a particular area — law firms, for instance.

Aon Specialty's Glenn Sandusky: *Compaq may become too focused on particular industries*

The goal is to get customer feedback that will enable Compaq to differentiate its high-end corporate systems through industry-specific products, software bundles and packaging. For example, it could offer manufacturing customers industrialized PCs.

"We need to get to customers where they work," said Ross Cooley, senior vice president of sales at Compaq. "You are going to see a proliferation of offerings and a broader product line."

Meanwhile, the ProLinea line will be beefed up to cut off any potential threat from Gateway 2000, Inc.

Users and analysts reacted cautiously to news of the corporate strategy.

"It definitely is one way of adding value to corporate customers, but you may start to miss the big picture," said Glenn Sandusky, chief information officer at Aon Specialty Group in Chicago and a former member of Compaq's major accounts council. He said Compaq might become too focused on particular groups.

Compaq officials said, however, that they would let select industry-specific resellers to do much or all of the customizing.

Corporate assistance

The vertical move will also see Compaq changing the way it supports corporate users. In June, the company will roll out new phone lines with support personnel dedicated exclusively to corporate accounts and issues. Today, service personnel may deal with anything from raw consumers on up.

Users have been grumbling that Compaq's service is not as good as it was before a field sales force revamp last year. Compaq officials conceded that their service could be better.

"They knew what my problem was, but they simply weren't interested in fixing it. I'm tempted to go to Dell," said one user in a branch office of a large government concern, who asked not to be named. But he said he was interested in seeing how the new approach will work.

Meanwhile, availability issues remain Compaq's biggest problem, according to Cooley. Analysts said that despite Compaq's unprecedented first-quarter success, they expect it will not outsell IBM for the entire year, partly for that reason.

Cooley said Compaq was in a better position supply-wise than during its crisis in the first half of last year, but he declined to say when the company might catch up. "I've been wrong every time before, so why would you believe me anyway?"

Cooley said Compaq was losing opportunities and had no idea of the level of demand for its products. He also said it will move to build-to-order manufacturing, a la Dell Computer Corp., but cannot do so until it catches up with demand.

FAST COMPAKTOR
...THE INTELLIGENT CHOICE

FASTCPK REORGANIZES 3390 DASD IN 2-5 MINUTES

SETS FOR PERFORMANCE

COMBINE FREE SPACE AREAS

COMPAKTOR releases over-allocated space, merges multi-extent data sets and consolidates free space on PS, PO, VSAM and DB2 data sets more efficiently than any other software!

COMPAKTOR can automatically sort the data sets in sequence by how recently they were used causing the most active data sets to be put next to the VTOC.

of volumes.

• CPK merges our VSAM files with many extents into 1 extent.

• 70% faster than DFDSS DEFRAG.

• 80% less CPU time and EXCP's.

IBM DEFRAG

```
//STEP4    EXEC PGM=ADDDSSU
//SYSPRINT DD   SYS
//DASD1    DD   VOL
                UNI
//SYSIN    DD   *
  DEFRAG   DDNAME=DASD
```

SIMPLE CONVERSION

Fast COMPAKTOR

```
//FASTCPK  EXEC PGM=FDDCPK
//SYSPRINT DD   SYSOUT=*
//SYSMAP   DD   SYSOUT=*
//SYSIN    DD   *
  COMPAKT TYPE=FASTCPK,VOL=TS0001
```

Free 90-day trial.
Send or call for a CPK versus DFDSS DEFRAG Comparison

INNOVATION DATA PROCESSING

Available for MVS/XA* and MVS/ESA*

CORPORATE HEADQUARTERS: 275 Paterson Avenue, Little Falls, New Jersey 07424 • (201) 890-7300

EUROPEAN OFFICES:	FRANCE	GERMANY	NETHERLANDS	UNITED KINGDOM	NORDIC COUNTRIES
	01-47-69-15-15	089-439-2053	036-534-1660	081-905-1266	+31-36-534-1660

News Shorts

Agencies team on telecom purchases

The military and civilian sides of the federal government will combine their multibillion-dollar purchases of telecommunications services. The **U.S. General Services Administration** (GSA), whose FTS 2000 contracts with **AT&T Corp.** and **Sprint Corp.** expire in 1998, said it will join with the **U.S. Department of Defense**, whose telecommunications network contract with AT&T expires in 1996. GSA administrator Roger W. Johnson called the combined buys a "potential billion-dollar savings for the American taxpayer." Pentagon information systems chief Emmett Paige Jr. said, "This consolidated effort would form the foundation of a global information infrastructure."

Oracle, Bell Atlantic interact for IS

Oracle Corp. and **Bell Atlantic Corp.** announced a deal last week intended to induce mainstream information systems shops to build multimedia and interactive TV applications. **Kaiser Permanente Health Plan, Inc.**, a nationwide health maintenance organization, is expected to contract with both companies for databases, development tools and consulting services for projects involving interactive voice, video and imaging projects.

Data centers spending less on tech

Data center work loads are still growing, but the centers are spending less on technology and personnel, according to **Nolan, Norton & Co.**'s annual data center baseline survey, released last week. In the 200 sites surveyed, data centers used 5% more processor capacity than last year. In the meantime, however, online user populations remained steady, and average processor loads were unchanged. Overall expenditures decreased by 5.5%, which Nolan, Norton attributed mainly to lower technology costs, especially in processors and disk arrays.

Software theft rises

Software vendors lost $12.8 billion worldwide last year due to software theft, according to the **Business Software Alliance**. Piracy in 1992 was estimated at $12 billion. By region in 1993, losses ranged from $822 million in Latin America to $4.9 billion in Europe. Some of the worst losses were in Japan, the alliance said, with only 20% of software in use there legally obtained.

Honeywell outsources messaging

Honeywell, Inc. said it will outsource its global messaging system to **Control Data Systems, Inc.** in a contract valued at $1.7 million over the next three years. The system will connect 35,000 Honeywell users in 95 countries. Control Data will deploy the system using its X.400- and X.500-based messaging products and will administer the network from its Arden Hills, Minn., headquarters.

SHORT TAKES Three quarters of the 40,000 people surveyed on the **Prodigy** on-line service said the late President Nixon's achievements outweighed his failures; 64% said they would vote for him over an incumbent President Clinton in a hypothetical election. . . Lois Juliber, chief technological officer at the **Colgate-Palmolive Co.** for the past two years, was named president of its $2.5 billion U.S./Canada division. . . **Computer Associates International, Inc.** said its CA-Unicenter distributed systems management package will support Digital Equipment Corp.'s Alpha AXP running the Open Software Foundation's OSF/1 operating system.

More news shorts, *page 16*

RISC chip market heats up

IBM, Fujitsu tighten their hold on the market with joint ventures

By Jean S. Bozman

Two of the world's biggest chip foundries, IBM and Fujitsu Ltd., last week tightened their grip on the worldwide market for RISC chips, which will power a new generation of enterprisewide open systems applications.

In twin moves one day apart, Fujitsu agreed to jointly design all future SPARC chips with Sun Microsystems, Inc., and Hitachi Ltd. agreed to use IBM's CMOS chips in its future mainframes. Hitachi will also be able to use IBM's Power and PowerPC chips in its line of high-end RISC parallel processors due in 1996 (see story below).

The agreements are expected to save the firms tens of millions of dollars by eliminating redundant research and development costs, industry analysts said. At the same time, the Japanese manufacturers — traditionally strong in IBM-compatible mainframes and PCs — will gain ground in the growing global client/server and Unix systems markets.

Revving up

Fujitsu has committed to using SPARC in its own product line and in that of ICL, of which Fujitsu owns an 80% interest. The agreement will boost SPARC's floating-point performance and create chip enhancements to increase the performance of Sun's Wabi interface for Windows software, Sun executives said.

U.S. market

The Japanese firms will distribute their products in this country. Fujitsu will sell its machines through Amdahl Corp., Sun's systems will be sold worldwide, and Hitachi will sell through Hitachi Data Systems Corp. in Santa Clara, Calif.

While users may hear the thundering steps of the big vendor agreements at a distance, analysts took sharp notice of the potential impact of four major computer companies standardizing on a few CMOS chips for enterprisewide applications. RISC chips are one type of CMOS chip.

"Everybody's moving to CMOS for large-scale systems, and they also seem to be rallying around the Power and SPARC flags for servers, and potentially, for parallel processors," said Steve Josselyn, manager of systems research at International Data Corp. in Framingham, Mass. The research firm said it believes Hitachi paid about $100 million for access to IBM's CMOS and RISC technology and the right to make modifications to it.

Sun and Fujitsu have drawn closer through their agreement to jointly design SPARC chips, boosting the floating-point performance of SPARC and enhancing 32-bit and forthcoming 64-bit designs. The pact eliminates legal barriers to intense cooperation in engineering, Sun officials said.

The Sun/Fujitsu agreement is intended to revitalize the fragmented SPARC market in the face of increased RISC competition, said Yoshiro Yoshioka, general manager of Fujitsu's open systems business and a board member of Fujitsu Ltd.

Slipping away

Many Sun workstation users have watched SPARC slip in the power race against rival RISC chips with dismay.

"I haven't seen anything in recent years to indicate that Sun is particularly focused on scientific floating-point computation," said Michael Pearlman, systems manager at Rice University's computational applied mathematics department in Houston. While the Fujitsu tie-in is interesting, "the bottom line is going to be whom the product hits," he said.

The SPARC clone market has been fragmented by lagging performance and different SPARC designs, analysts said. Several SPARC chip manufacturers have walked away, including Cypress Semiconductor Corp. in San Jose, Calif., which sold its SPARC-fabrication unit to Fujitsu last year. "There's been a real love/hate thing between Sun and the clone market," said Terry Bennett, director of technical systems research at Computer Intelligence/InfoCorp in Beaverton, Ore.

The deal between Sun and Fujitsu leaves room for further cooperation in client/server systems and software, said Sun Chief Information Officer Bill Raduchel, who helped negotiate the agreement with Fujitsu. "The master agreement we put in place simply creates the framework of cooperation between the two companies," Raduchel said.

Mainframe development

Hitachi sharpens technical edge

By Jean S. Bozmon

Hitachi Ltd. last week signed a pact with IBM that enables it to resell IBM's Powerparallel RISC-based servers and use IBM's CMOS chips to build a new class of mainframes. Analysts value the agreement at $100 million (see story above).

Hitachi will also use IBM's Power and PowerPC RISC chips for its RISC-based parallel processors.

In force until 1999, the agreement is expected to reduce Hitachi's manufacturing costs, industry analysts said. It should also speed a new generation of Unix-based parallel processors to market.

The two firms also agreed to cooperate on the development of interfaces, middleware and software for the new CMOS and RISC systems.

The deal will give a technical edge to Hitachi Data Systems Corp. over mainframe competitor Amdahl Corp., which gets its hardware from Fujitsu Ltd., said Steve Josselyn, an analyst at International Data Corp. in Framingham, Mass.

HDS will market the CMOS-based Hitachi mainframes in the U.S., said HDS Chief Executive Officer John Staedke.

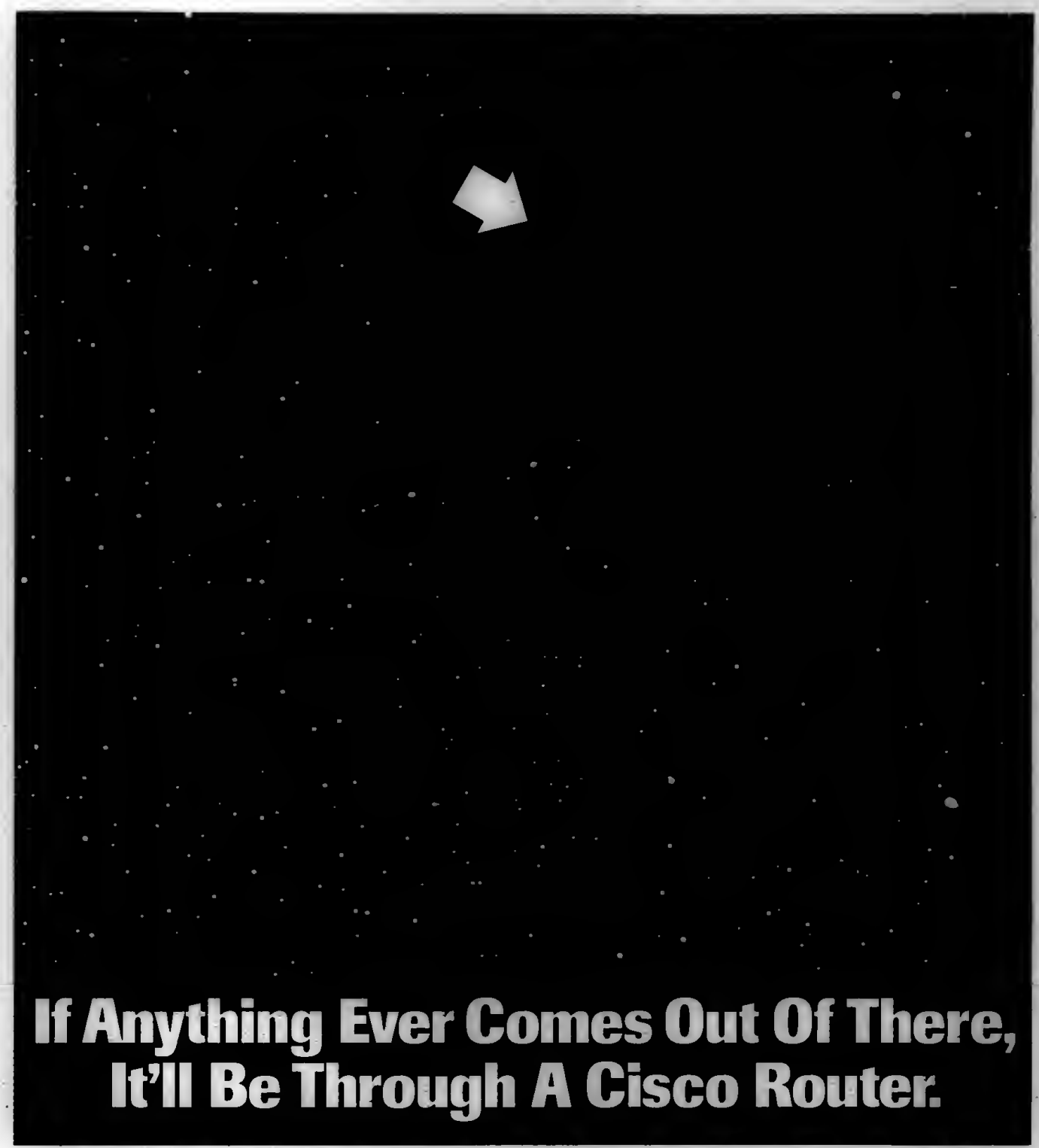
Lower prices

"It's clear there are eventual limits to how low pricing can go in existing [mainframe] technology because it's expensive to manufacture," Staedke said. "CMOS implementations of parallel processors with [IBM] System/390 capabilities offer the prospect of similar functionality with significantly lower prices."

HDS is also using existing technology to build a mainframe uniprocessor with more than 100 MIPS [CW, April 25].

Hewlett-Packard Co. said the IBM/Hitachi deal would not affect its agreement with Hitachi Ltd. to use HP PA-RISC chips in Unix workstations and servers.

"The relationship HP has is with the semiconductor and systems businesses at Hitachi," said HP spokesman Jim Christensen, "and those relationships are unchanged."



If Anything Ever Comes Out Of There, It'll Be Through A Cisco Router.

It's amazing how far your sphere of influence can reach, once you get your hands on the right routers. No matter how big your network grows, Cisco will help you spend less time managing it, without adding personnel. With CiscoWorks,™ a series of easy-to-use software applications, you can manage your router network automatically from one central location. CiscoWorks automates tasks such as monitoring and controlling configurations for all your routers. You can send commands, including security password updates, to multiple router sites. Easily maintain inventory of router operating software. And distribute control over various groups of routers. Only Cisco routers give you these capabilities. So follow the leader. Call Cisco today at 1-800-859-2726. We'll show you a way to manage a growing network that will save your company both time and money. Today, and for many, many light years to come.

CISCO SYSTEMS

©1993 Cisco Systems, Inc. All rights reserved.

Visit us at Booth #3771 at Networld + Interop, Las Vegas.

Iceberg

CONTINUED FROM PAGE 1

Still, Peter and some customers said they remain leery of any bugs that have not yet been thawed out of Iceberg even though StorageTek claims to have resolved all outstanding software problems. Iceberg's glitch-filled history continues to "raise questions as to whether it will be reliable," Peter noted.

Other prospective clients viewed the technical delays in a more positive light. "StorageTek did it right by not releasing Iceberg until it was absolutely ready," said Wayne Pattison, director of data center operations at Kansas City Southern Railway Co. in Missouri. "I wouldn't want to be serial number 1 off the line, but I think it will be trustworthy."

"We knew [Iceberg] was a pretty complex environment and that there were a lot of technical problems that would have to be resolved," said Leonard E. Accardo, director of global information processing at Merrill Lynch & Co. in New York. Accardo said he remains bullish on StorageTek's subsystems.

BMC Software, Inc., which received Iceberg several months ago, is pleased with its performance thus far.

"We told our user group last week that Iceberg's initial performance has exceeded our expectations," said Eric Brubaker, director of MIS at the Houston-based systems software vendor. Other early Iceberg shops include MCI Communications Corp. and the Defense Logistics Agency.

Icebreaker

Back-order pileup promises fast deployment of StorageTek's Iceberg

1994 PROJECTIONS

Shipments	Revenue*
600	$350M

* Revenue accounts for 400 units; revenue for remaining 200 will be applied to fiscal 1995

Source: Kemper Securities, Inc., Chicago

Competition remains

Nonetheless, the numerous delays have allowed competitors to surge past Iceberg, for example EMC Corp. with its Symmetrix disk array subsystems. IBM, which will introduce its first redundant arrays of inexpensive disks (RAID) subsystems next month, was able to play catch-up.

StorageTek "admitted that, in a read-intensive environment, EMC would beat them," said Nick Allen, vice president and storage director at consultancy Gartner Group, Inc. in Stamford, Conn.

Yet Allen said positive feedback from early Iceberg users has renewed the confidence of Gartner's storage clients. "Iceberg fever is starting to catch again," the analyst added.

Pattison, Accardo and Peter each said they will consider products from all three vendors before deciding on direct-access storage device (DASD) replacements.

Financial effects

StorageTek, which expects to begin generating Iceberg revenue this quarter, continues to stand by its projection of $350 million in Iceberg sales by year's end, said Joseph Payne, an analyst at Kemper Securities, Inc. in Chicago.

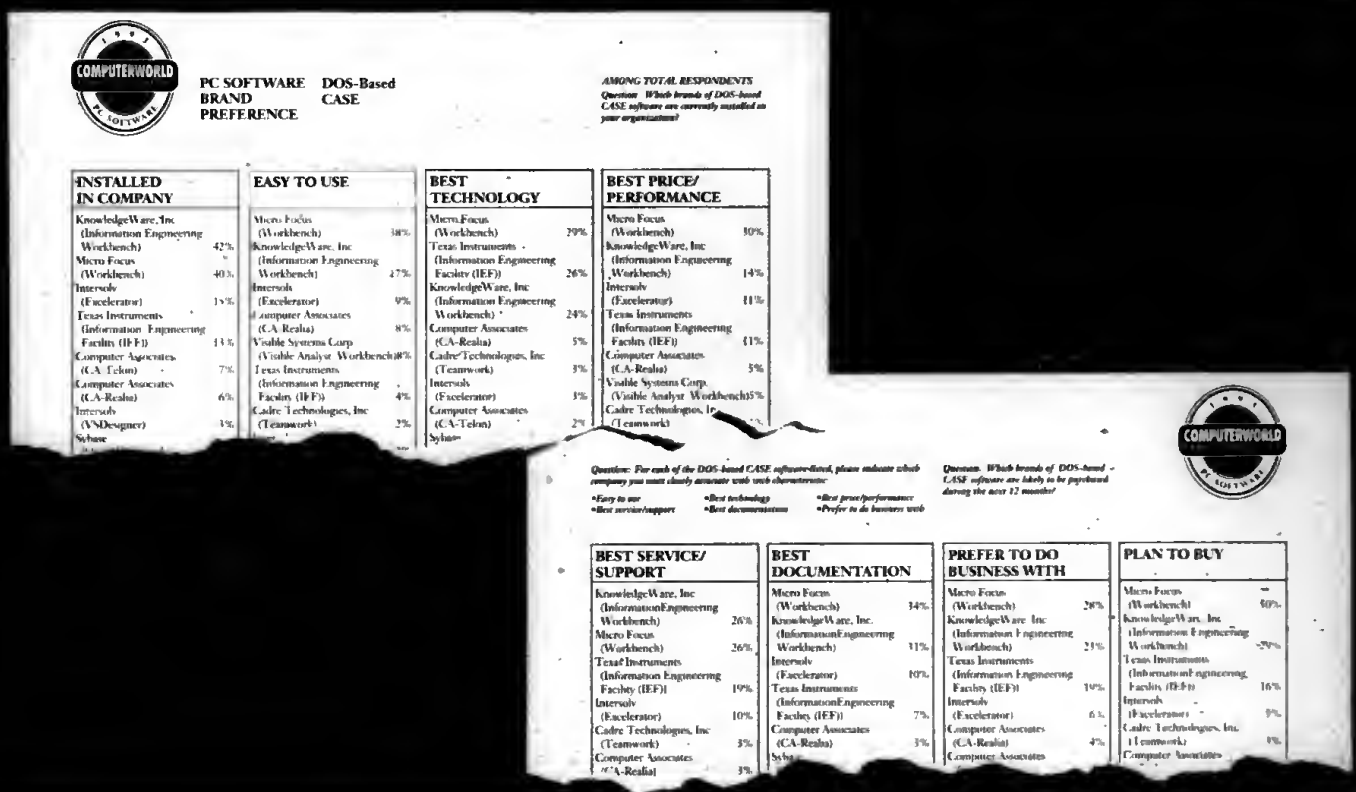
Iceberg revenue will be a refreshing change for StorageTek, which posted a $19.6 million net loss for its first quarter ended April 1. For the same period, revenue remained stagnant at $335.6 million.

In addition to Iceberg, StorageTek is close to completing beta testing for its Nordique disk array subsystems. Nordique, another RAID Level 5 subsystem designed for IBM MVS mainframe environments, should begin shipping this summer; it could represent an additional $150 million — or 30% — of StorageTek's DASD revenue for fiscal 1994, said Mark C. Jordan, a financial analyst at A. G. Edwards & Sons, Inc. in St. Louis.

Furthermore, StorageTek is readying two other traditional DASD replacements. A high-capacity subsystem, code-named Kodiak, and Arctic Fox, a high-speed DASD device, are slated to begin shipping in the second half of this year, according to a StorageTek spokesman.

Still, StorageTek is expected to face increased competition as the high-end storage market heats up over the summer, when competitors such as EMC, IBM and Amdahl Corp. are each shipping disk array subsystems, Allen said.

We didn't say COBOL Workbench is the best in the world. You did.



COMPUTERWORLD 1993 PC SOFTWARE

PC SOFTWARE BRAND PREFERENCE — DOS-Based CASE

AMONG TOTAL RESPONDENTS

Question: Which brands of DOS-based CASE software are currently installed in your organization?

INSTALLED IN COMPANY		EASY TO USE		BEST TECHNOLOGY		BEST PRICE/ PERFORMANCE	
KnowledgeWare, Inc (Information Engineering Workbench)	42%	Micro Focus (Workbench)	38%	Micro Focus (Workbench)	29%	Micro Focus (Workbench)	30%
Micro Focus (Workbench)	40%	KnowledgeWare, Inc (Information Engineering Workbench)	27%	Texas Instruments (Information Engineering Facility (IEF))	26%	KnowledgeWare, Inc (Information Engineering Workbench)	14%
Intersolv (Excelerator)	19%	Intersolv (Excelerator)	9%	KnowledgeWare, Inc (Information Engineering Workbench)	24%	Intersolv (Excelerator)	11%
Texas Instruments (Information Engineering Facility (IEF))	13%	Computer Associates (CA-Realia)	8%	Computer Associates (CA-Realia)	5%	Texas Instruments (Information Engineering Facility (IEF))	11%
Computer Associates (CA-Telon)	7%	Visible Systems Corp (Visible Analyst Workbench)	8%	Cadre Technologies, Inc (Teamwork)	3%	Computer Associates (CA-Realia)	5%
Computer Associates (CA-Realia)	6%	Texas Instruments (Information Engineering Facility (IEF))	4%	Intersolv (Excelerator)	3%	Visible Systems Corp (Visible Analyst Workbench)	5%
Intersolv (VSDesigner)	3%	Cadre Technologies, Inc (Teamwork)	2%	Computer Associates (CA-Telon)	2%	Cadre Technologies, Inc (Teamwork)	1%
Sybase				Sybase			

Question: For each of the DOS-based CASE software listed, please indicate which company you most closely associate with each characteristic:

•Easy to use •Best technology •Best price/performance
•Best service/support •Best documentation •Prefer to do business with

Question: Which brands of DOS-based CASE software are likely to be purchased during the next 12 months?

BEST SERVICE/ SUPPORT		BEST DOCUMENTATION		PREFER TO DO BUSINESS WITH		PLAN TO BUY	
KnowledgeWare, Inc (InformationEngineering Workbench)	26%	Micro Focus (Workbench)	34%	Micro Focus (Workbench)	28%	Micro Focus (Workbench)	30%
Micro Focus (Workbench)	26%	KnowledgeWare, Inc. (InformationEngineering Workbench)	11%	KnowledgeWare, Inc (Information Engineering Workbench)	21%	KnowledgeWare, Inc (Information Engineering Workbench)	29%
Texas Instruments (Information Engineering Facility (IEF))	19%	Intersolv (Excelerator)	10%	Texas Instruments (Information Engineering Facility (IEF))	14%	Texas Instruments (Information Engineering Facility (IEF))	16%
Intersolv (Excelerator)	10%	Texas Instruments (InformationEngineering Facility (IEF))	7%	Intersolv (Excelerator)	6%	Intersolv (Excelerator)	9%
Cadre Technologies, Inc (Teamwork)	5%	Computer Associates (CA-Realia)	3%	Computer Associates (CA-Realia)	4%	Cadre Technologies, Inc. (Teamwork)	8%
Computer Associates (CA-Realia)	3%	Sybase		Computer Associates		Computer Associates	

We've always believed Micro Focus COBOL Workbench® is the best in the world. Now you've confirmed it by unequivocally placing it first in the 1993 *Computerworld PC Software Brand Preference* survey.

You voted COBOL Workbench as **Best Technology** and **Easy to Use**. That's not all. Workbench has also won top honors in **Price/Performance, Best Documentation, Plan to Buy**, and most importantly, you chose Micro Focus as the company you **Prefer to do Business With**. According to you there was no contest.

Not surprising really. There is no better technology for developing new systems or re-engineering existing applications on the workstation. Programmers find Workbench puts them directly in control of their development environment, delivering quality business applications on time and on budget.

If it isn't Micro Focus COBOL Workbench, it isn't in the running. That's not just our opinion, it's yours.

For your free copy of the 1993 *Computerworld* survey, or for more information, call **800-MF-COBOL, (800-872-6265).**

MICRO FOCUS

Micro Focus Inc. 2465 East Bayshore Road, Palo Alto, CA 94303. Tel. (415) 856-4161.

Micro Focus and COBOL Workbench are registered trademarks of Micro Focus, Inc. All other trademarks are property of their respective companies.

GSA Contract Number GS00K93AGS6403. In Canada call IBM Canada at 1-800-465-1234.

IBM initiatives target OS/2 desktops

By Ed Scannell
SAN FRANCISCO

Despite the continued lack of bundling deals between hardware suppliers and top application developers, IBM's Personal Software Products group last week continued its quest to gain broader desktop acceptance for OS/2.

At its developer's conference here last week, the company spelled out plans for a long-awaited version of OS/2 for Windows that will simultaneously run multiple applications acceptably in just 4M bytes of memory.

The product, called Personal OS/2 by one IBM official, is expected to be much easier for inexperienced users to install. Through a "dashboard" and three-dimensional icons, it should also be easier for users to use the operating system's more complex capabilities and manipulate applications.

"We are doing pretty well among experienced users, but we need to get away from the programmer environment and adapt [OS/2] more for new users," said Lois Dimpfel, director at Personal Software Products' Programming Center in Boca Raton, Fla. "We want to give them a simpler way to do things like read a file, print or get on-line help."

IBM said it hopes the product can keep up the sales momentum established by the first version. It is expected to enter beta testing in about 30 days with the finished version shipping in early summer.

Since mid-November, the division has shipped a little more than 500,000 copies of OS/2 for Windows in the U.S. alone. The company has now shipped a total of 5 million copies of OS/2 Versions 2.0, 2.1 and OS/2 for Windows, according to IBM officials.

More competitive

But more importantly perhaps, it is Personal Software Products' hope that a truer 4M-byte version of the product will encourage more hardware OEMs to bundle it exclusively with their systems — something the company badly needs to become more than a niche player against Microsoft Corp.'s Windows juggernaut.

Personal Software Products officials also said last week that the company has renamed its upcoming Workplace OS operating system to OS/2 for the PowerPC. The product, an IBM adaptation of the Mach microkernel from Carnegie Mellon University in Pittsburgh, is now expected to enter beta testing sometime in the third quarter. It is still on schedule for delivery by year's end, officials said.

Within reach

If IBM meets the prediction of International Data Corp. and sells 5 million copies of OS/2 this year, the user base would be within arm's reach of the 10 million mark.

While work on a version of Microsoft's Windows NT for IBM's PowerPC-based systems has already entered limited beta testing, company officials said it is unlikely the product will be commercially available before OS/2 for the PowerPC.

"We suspect they will be released at about the same time," said Miles Barel, Worldwide Workplace OS brand manager.

In a third announcement, the division also formally unveiled PC DOS 6.3 last week. Unlike Microsoft's MS-DOS 6.2, which is currently shipping, PC DOS 6.3 has a built-in compression utility. While Version 6.3 will contain IBM's SuperStor/DS compression utility, IBM said it will include a version of Stac Electronics' best-selling Stacker utility in future versions.

Microsoft is expected to provide users with a compression program that replaces DoubleSpace, which the company removed from Versioo 6.2 because it infringed on two patents owned by Stac.

The new version, priced at $77 for DOS 2.1 through MS-DOS 6.0 or $24 for PC DOS 6.1 users, also features built-in support for pen-based applications and PCMCIA cards. In addition, it has several fully featured utilities, including Central Point Software, Inc.'s Backup, RAMboost and Scheduling programs.

Delayed, but on the way

The Workplace Shell for PC-DOS versino, initially expected in the first half of this year, has been delayed until the fourth quarter so the company can beef up its feature set. The product will now likely ship at the same time as PC DOS 7.0.

While PC DOS 7.0 will remain a 16-bit product, it will likely include lower-level multitasking capabilities. It will also have several built-in features for mobile users such as the ability to carry on a communications session while another application is on screen, Dimpfel said.

Delays ahead for Pentium systems

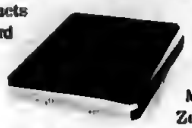
Vendors differ with Intel on chip availability

By Jaikumar Vijayan

Despite Intel Corp.'s early announcement of 90-MHz Pentium processors in March, customers will have to wait at least six more weeks for systems based on the chip to ship in volume.

Among those queried, only Dell Computer Corp. quoted a two-week delivery date.

Several vendors that have already announced products based on the high-end Pentium chip are now quoting lead times of at least six to eight weeks, and major resellers last week confirmed that there is lack of availability of the products.



"Supplies are trickling in, but I don't see volume for another 60 days at least," said Pat Ohoro, marketing director of systems at computer reseller Tech Data, Inc.

Supply and demand

Meanwhile, user inquiries for systems based on the new processors have been steadily picking up. "In the next quarter, demand will clearly outstrip supply," Ohoro predicted.

"We've had a lot of interest in Pentium models," agreed Joe Barr, networking product manager at Eatex Information Services.

So far, almost every major vendor, with the exception of Compaq Computer Corp., has announced products based on the processors. Few are actually shipping.

Gateway 2000, Inc., which was among the first to announce Pentium machines, is quoting a lead time of at least 35 days for delivery. AST Research, Inc., which announced a Pentium prodoct coinciding with Iotel's March unveiling, said it will start shipping in July — or possibly even August. Companies such as Micron Computer, Inc., Zeos International Ltd. and Acer America Corp. all have similar lead times.

"It's going to take us probably four to six weeks to get into any kind of meaningful production" oo Pentium 90-MHz systems, said Dave Kirkey, vice president of marketing at Advanced Logic Research, Inc. in Irvine, Calif.

According to some sources, one possibility for the system delays could be the relatively slow availability of associated chip sets, which provide Peripheral Component Interconnect (PCI) and dual-processor multiprocessing overdrive support.

Intel, however, denied any availability problems. The company said the processor was shipping in full volume and added that it does not anticipate any future delays. Intel also said there were no supply problems as far as its Neptune PCI chip set was concerned. "We are shipping in volume, and we are meeting all of our customer demands," said a spokeswoman at Intel.

PCI chip issues

Intel is the largest supplier nf PCI chip sets for Pentium processors and also makes motherboards with integrated PCI support, CPU and memory.

However, some systems manufacturers use motherboards designed from the ground up for the new CPU and integrate PCI support using chip sets from outside vendors. But there has been limited availability of PCI support sets from chip set vendors such as Opti Computer, Inc. in Santa Clara, Calif., and Forex Computer Corp. in San Jose, Calif.

"A lot of PC manufacturers are frustrated with PCI availability," said C. O. Hung, director of sales and marketing at Forex. "If you want the motherboard bundled with CPU memory and PCI support from Intel, there is no problem. However, they pot you on allocation if you just want the PCI chip sets."

Intel uses price cuts to lure i486 users tn Pentium. See page 43.

Microsoft, TI to create repository

By Melinda-Carol Ballou

■ Microsoft Corp. and Texas Instruments, Inc. are expected to announce this week that they will join forces to create an object-oriented repository. The move seeks to combine the traditional strengths of each company: control of the desktop and enterprise development.

Early design specifications and application programming interfaces for the repository are expected to be made available this fall to independent software vendors, company sources said. But users will have to wait two years before the repository itself is expected to be available.

If a successful product does emerge, analysts said, it could help developers reduce the confusion of client/server development by providing a centralized location for application components and objects.

Rocky road

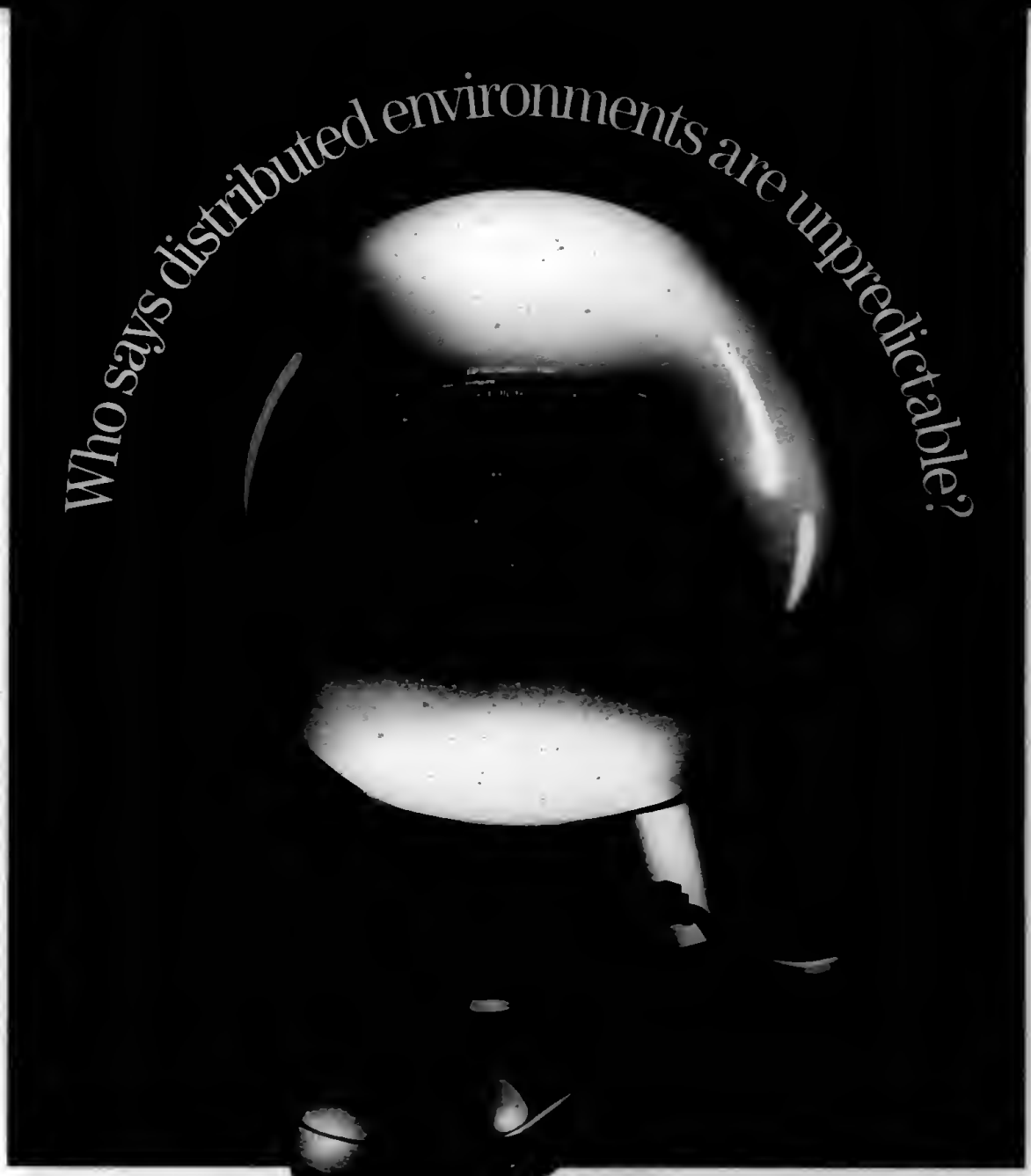
The road to a repository will be far from smooth for Microsoft and Texas Instruments. In the past, vendors have refused to standardize on competitive repositories.

Industry and internal sources said TI developers are working with Microsoft to build an information model for the Microsoft repository. It will include an engine to handle a range of functions.

Sources said the repository will initially be available on Microsoft's Windows NT. It is ultimately expected to reside on top nf the object file system for Cairo, Microsoft's planned object-oriented operating system.

"On the positive side, I'm convinced that client/server isn't going to go anywhere without a repository, so they're on the right track," said Ed Acly, an analyst at International Data Corp., a Framingham, Mass., consulting firm, when informed of the deal. "But it's far from clear whether it will fly or not."

Acly added that TI's Information Engineering Facility is not object-oriented and that melding the two companies will not necessarily address the weaknesses of either.



HP's performance management tools show you the future in time to change it.

Today, the way to manage your systems can be crystal clear. Thanks to the vision provided by our performance and resource management tools. Giving you the kind of control previously available only in mainframe environments.

Our family of products provides everything from top-down enterprise overviews using HP PerfView to nitty-gritty system diagnostics with HP GlancePlus.

To plan and manage your resources, we offer HP PerfRX and HP Performance Collection Software.

Working together, they help you increase user productivity and maximize system utilization. While reducing management costs. You'll be able to see problems in time to avoid them. Even future needs become predictable.

HP has long played a prominent role in Open Systems management. With HP OpenView, we showed the way to manage integrated networks.

So it's no wonder we're the leader in tools for the distributed computing environment.

To see more, call 1-800-237-3990, Ext. 2826 for our free video. The future will look much brighter when you look at it with us. **The performance management leader for the distributed age.**

HEWLETT® PACKARD

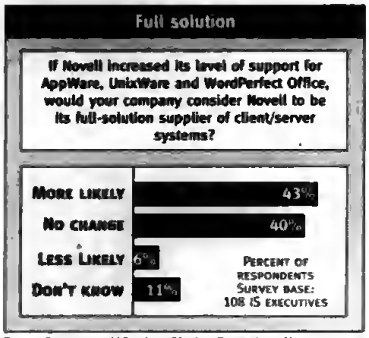
©1993 Hewlett-Packard Company

Desktop

CONTINUED FROM PAGE 1

vironment."

In their move to open client/server systems, corporations deal with dozens of vendors while trusting none of them to provide enterprise-level solutions, users said. Yet at the same time, users still need consultation and direction to implement their downsizing strategies.



Source: Computerworld Database Division, Framingham, Mass.

Winning over the market

"Both Microsoft and Novell realize that going through Egghead [Discount Software] is not going to drive enterprise-level solutions," said Phil York, vice president of technology research and alliances at SHL Systemhouse, Inc., an integrator that works with both vendors.

"What they now provide with their partner program is a way to effectively encourage the market to adapt their technology more systematically, to move it up the food chain," he said.

Users emphasized, however, that they do not want a systems integrator to function as an intermediary between them and their major client/server systems suppliers.

Shepard said his company makes wide use of value-added resellers, consultants and integrators for finite projects. However, he said it makes sense over the long term to rely on one's internal developers backed up by training, education and support provided by the primary client/server systems vendors.

The problem, users said, is that vendors such as Novell and Microsoft have yet to fill the gap with direct support and product information services on an enterprise level.

"They still tend to act like shrink-wrapped software vendors," leaving the customer in the lurch when it comes to "design support, architectural support, defining the environment and how best to use products and what not to do with them," Shepard noted.

Users need insight

Users said they want vendors to brief them on product strategy and delivery timetables so they can better plan their technology strategies.

"All we want them to say is what they're doing and for them to do it well," remarked David Sherr, first vice president at Shearson Lehman Brothers, Inc. in New York.

Novell has responded to some of the above needs with its new support programs (see box at left).

IBM has established an expectation of a certain level of service, creating a void in the client/server arena, said Tom Gildea, vice president of business information services at Helene Curtis, Inc. in Chicago.

Sherr said the combination of vendors doing what they do best, with systems integrators playing a consulting role, all comes down to execution. However, users expressed skepticism over whether these efforts would play out as planned.

"One-stop shopping has appeal," Sherr said. "It depends on how good the stop is."

In a nutshell

Novell's Corporate Account Program will provide more direct, ongoing support to corporate customers or major accounts that spend at least $250,000 on Novell products annually.

Key features include the following:

- Early information on product architectures and technologies.
- Participation in special interest groups focusing on a specific Novell technology, such as document management or telephony.
- Workshops on systems design, development and implementation using Novell products.
- Access to Enterprise Services Division consultants at Novell.
- An on-site Novell account manager.
- A 10% discount on corporate NetWare purchases in 10-node packages.
- Prerelease products for evaluation.
- Priority status for beta-site selection.

First things first

Joyce Young, director of information systems at Tellabs, Inc. in Lisle, Ill., has found herself in the fortunate position of starting a client/server initiative by first creating the architecture.

When Young joined Tellabs earlier this year, the telecommunications supplier had not yet migrated its systems to a distributed platform, so her first order of business was to work on the plan.

Tellabs' Joyce Young

In Tellabs case, there will be three architectures, or models, that will govern business applications, data and the technical platforms. Young said some companies may hesitate to take on an architecture project because those words can imply a massive, long-term job. But she insists it can be done in short order.

"I wouldn't recommend taking six months," Young said, adding that Tellabs' business applications architecture is now complete. "We crunched to get this done, because we have stuff to do."

— *Rosemary Cafasso*

Corporate

CONTINUED FROM PAGE 1

consistent plan so applications are interoperable and development costs are under control.

In contrast, the first group of client/server applications deployed at American used several different operating systems, Lewis said. "What we have is legacy client/server systems," she noted.

"Five years ago, we were not really concerning ourselves with the coherency of the architecture," Lewis said. "Each team was focusing on the needs of their particular application."

An increasing number of companies with client/server projects under way are just now realizing they need a blueprint to really make them work, said Patricia Seybold, president of Patricia Seybold Group, which hosted its annual technology forum last week in Cambridge, Mass.

"We are seeing customers rolling out [client/server systems] with up to 200 seats and now saying we have to go back and redo the infrastructure," Seybold said.

Architecture is critical

At many companies, what often began as a few isolated client/server pilot projects grew into a collection of systems as the concept of client/server computing grew in popularity. As companies begin taking client/server computing enterprisewide, the need for an architecture is all the more critical, observers added.

Typically, architectures can include the basic system infrastructure, such as networking, operating systems and hardware platforms. They can also cover a broader set of issues by providing development guidelines, including recommended tools and data management and access methods.

With an architecture, companies can realize cost savings by avoiding the reinventing-the-wheel syndrome and achieving better integration.

Users are finding other costs savings associated with architectures, as well. Chase Manhattan Bank NA, for example, has established Sybase, Inc.'s database management system as one of its key data management platforms. Because of the volume of Sybase licensing, Chase has a discount program with the company, said Jonathan Vaughan, a vice president in IS.

The bank established a working group to put client/server guidelines in place two years ago after it saw a few isolated applications pop up, Vaughan said.

"The two earliest projects were from completely different locations," Vaughan said. "One was an internal systems tool using a LAN-based database system. The other was a customer service system in Delaware, with OS/2 on workstations and leaving the core functionality on the host."

Tracking the differences

Vaughan said Chase not only saw two different platforms but also two different approaches to client/server models. "We saw [client/ server] as something that would increase across the board," Vaughan said.

Martio Garvey, an analyst at Meta Group, Inc. in Westport, Conn., said he also has tracked an increase in modeling activity among clients. "It [first] took place departmentally," Garvey said. "All of a sudden you had new apps being developed, and [the question was], 'Where's the architecture?' People didn't think about it."

"I don't think anyone is scrapping what they've done," Schay added. "But the consequences are that some of the technologies [already installed] will be difficult or expensive to tie into this new architecture."

Five steps to take before a client/server launch

- **Identify the type of application** — Transaction processing, decision support or communications.
- **Determine the network profile** by the traffic flow this application will likely produce.
- **Select the core system pieces,** including hardware, operating system and user access mechanism.
- **Choose a client/server scheme** that best suits the application, such as the classic model where the client handles presentation and the server manages functional logic and data storage.
- **Decide on an implementation model** by picking the appropriate number of "tiers" the system should have. For example, if legacy data is central to this application, a three-tiered model including the host database is most appropriate.

SOURCE: PATRICIA SEYBOLD GROUP

Apple servers draw mixed reviews

By Mark Halper

User reaction to servers introduced by Apple Computer, Inc. last week was lukewarm, as praise for the systems' power was tempered by software concerns.

Although Apple trumpeted the PowerPC-based Workgroup Server 6150, 8150 and 9150 for their built-in support of Novell, Inc.'s NetWare network operating system [CW, April 25], the company said NetWare will not be native on the servers until year's end. This is because Apple will offer NetWare Version 4.1, which is slated to ship in the fourth quarter.

PowerPC servers hit streets

Model	Speed	Memory	Storage	Price
6150	60 MHz	*8M bytes	500M bytes	$4,219
8150	80 MHz	*16M bytes	1G byte	$7,459; $8,499 w/AppleShare
9150	80 MHz	**16M or 24M bytes	2G bytes	$9,229; $10,269 w/AppleShare

All models are based on the PowerPC 601 microprocessor and are available today.
* expandable to 72M bytes
** expandable to 264M bytes

Novell already offers a NetWare Loadable Module that supports Macintosh clients, but it runs only on Intel Corp.-based servers, said Apple product manager Gary Schare.

Users such as Nick Kontis, unit manager at Southern California Edison Co. in Rosemead, Calif., said he will wait and see how well Apple implements NetWare. Until then, he will continue to rely on some 30 Intel-based boxes that act as servers in various networks comprised of some 4,000 PCs and Macintoshes.

Upgrades available

Apple is also offering upgrade boards for its 68040-based Workgroup Servers and Quadra systems. Upgrade prices range from $1,259 to $2,499.

"It would be a piece of heaven if the NetWare, release on the [Workgroup Servers] would seamlessly operate with the existing architecture we have, but we don't know yet that it will," Kontis remarked.

Nothing compelling

Roger Bundy, manager of computing platforms at Taco Bell Corp. in Irvine, Calif., said that until Apple makes NetWare native on the servers, he has no compelling reason to buy one.

He will, in the meantime, continue to use Intel-based servers to support about 800 Intel desktop and 600 Macintosh desktop boxes, he said.

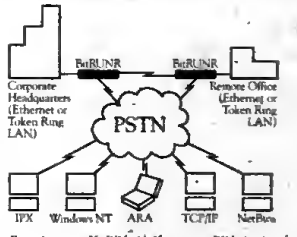
If the new Workgroup Servers prove to be worthy NetWare boxes, Bundy said he would be eager to install them because he has found Apple systems easier to set up and support compared with Intel systems.

Another Macintosh user, Arthur Tisi, chief systems officer at the Metropolitan Museum of Art in New York, said he will continne to use Intel-based servers even for his Macintosh clients.

Tisi explained that he has already soured on the 2-month-old PowerPC desktop offerings because his own testing has shown that they run Windows software at unacceptably low speeds. And there is still little native software that takes advantage of the Power Macintosh line.

His decision not to purchase one of the new servers "fundamentally gets down to the issue of the PowerPC. We had one on evaluation in the hopes we would buy some, but it ran [Windows] like a 286 or worse," he noted.

Prices for the servers range from $4,219 to $10,269.



Remote users. Multiple platforms, multiple protocols.

BitRUNR™ broadens the landscape for dial-up enterprise networks.

Now you can extend the power of your enterprise system to all your remote users. With BitRUNR, your mobile users, telecommuters and branch office workers will enjoy easy, seamless access to the corporate network.

As the first high-performance, multiprotocol, dial-up brouter (bridge/router), BitRUNR provides remote users on all platforms unparalleled interoperability with all major protocols, including IPX, TCP/IP, AppleTalk, Windows NT, XNS, DECnet and others. From desktop, laptop or cellular environments, those users can be part of the network, using either ordinary or cellular modems as the situation requires.

BitRUNR minimizes line charges with on-demand dial-up bridging and routing. It optimizes performance in LAN-to-LAN connections with inverse multiplexing and can be configured for leased-line backup.

BitRUNR is part of a total Motorola UDS solution that ranges from laptop, to LAN, to digital. For details, call your distributor or contact us, today! 5000 Bradford Drive, Huntsville, AL 35805-1993.

800/451-2369

MOTOROLA UDS

ISO 9001 Registered

All names, products and services mentioned are the trademarks or registered trademarks of their respective organizations.

News Shorts

IBM executive resigns unexpectedly

Gerald Czarnecki, the human resources chief in charge of paring down IBM's work force, quit abruptly last week. He reportedly was under pressure from IBM Chairman Louis V. Gerstner Jr. to move more quickly in his task. Of the 35,000 employees IBM hopes to lay off by year's end, only about 7,000 have left.

Commercial cellular data service debuts

Bell Atlantic Mobile, the cellular arm of Bell Atlantic Corp., last week rolled out the first commercial application of Cellular Digital Packet Data (CDPD) in Pittsburgh and the Washington/Baltimore corridor. Bell Atlantic officials said they expect their CDPD-based Air Bridge service to be up and running in the 61 largest U.S. markets by year's end. It will cost some 16 cents per message, depending on volume.

TI to unwrap more notebooks today

Texas Instruments, Inc. will announce today the TravelMate 4000M series of notebook computers. The series will feature SCSI II, a built-in Musical Instrument Device Interface (MIDI) port, 16-bit sound, Intel Corp.'s Indeo Video and a portable docking station with a built-in CD-ROM drive. Depending on the configuration and screen type, models weigh between 5.9 and 6.4 pounds. Prices on the 486-based line start at $2,149 and top out at $5,299 for a 25/75-MHz DX4-based model with a 340M-byte hard drive and a thin film transistor active-matrix color screen.

Working on the (electronic) highway

The U.S. Advisory Council on the National Information Infrastructure last week launched three "Mega-Projects" intended to provide a framework for the council's work on the so-called information superhighway. One will determine goals for key applications in health care, electronic commerce and public safety; the second will examine issues of access and cost; and the third will study issues related to the rights of users and vendors. The projects are chaired by a combination of government and computer industry representatives.

Modem maker agrees to settle suit

Hayes Microcomputer Products, Inc. in Norcross, Ga., has agreed to settle **Federal Trade Commission** charges that it made false and misleading claims in an advertising campaign that touted the escape sequence of one of its modems. Hayes' ad, which compared other technologies to a time bomb, allegedly misrepresented its technology as the only escape method available that doesn't create a substantial risk of data transmission failure. The proposed settlement would prohibit Hayes from making similar claims for its modems in the future.

Lotus' electronic forms tool to debut

Lotus Development Corp. plans this week to unveil its electronic forms software, Lotus Forms, with shipping scheduled for June 27. The software will allow users to design, route and track electronic forms, such as mortgage applications. Users will also be able to route the forms both inside and outside their companies using Lotus' CC:Mail or Notes or Microsoft Corp.'s Mail. The product is aimed at competing packages from Delrina Corp., JetForm Corp. and WordPerfect Corp.

SHORT TAKE The Clinton administration, in a move to counter Japan's dominance of a technology market, last week announced a five-year plan to spend $580 million helping U.S. companies build factories to produce flat-panel computer screens.

Carriers to demo coast-to-coast SMDS network service at Interop

By Ellis Booker

■ A group of local and interexchange carriers will demonstrate Switched Multimegabit Data Service (SMDS) running from one coast to the other this week at the Networld/Interop '94 show in Las Vegas.

SMDS is a "connectionless" switched public network service, ranging in speed from 56K to 34M bit/sec.

Participating in the demo will be Pacific Bell, MCI Communications Corp., GTE Telephone Operations and Bell Atlantic Corp. — all members of the National SMDS Inter-Carrier Interface Consortium. The carriers will demonstrate several applications, including Internet access, as well as access to medical images and video clips.

Dick Shimizu, Pacific Bell product manager, said the event will show that the Inter-Carrier Interface standard, finalized in March by Bellcore, works.

"This begins the process of making SMDS a nationwide service," said Shimizu, who is also chairman of the consortium.

Glimpse of tomorrow

For Pacific Bell, which now offers SMDS in eight of its 10 local access transport areas (LATA), the event also telegraphs future service announcements, such as a plan with MCI to provide inter-LATA SMDS to some test customers in June. MCI is targeting general availability for this service in September.

"For a ubiquitous data network, it has a lot of potential, particularly because it ... does not require permanent virtual circuits," said Charles Baker, president of Telecommunications Engineering, Inc. in Richardson, Texas.

Baker observed that the recently codified switched virtual circuit specification for frame relay might be years away from implementation by hardware vendors and carriers. But those already using SMDS for a metropolitan-area network said nationwide connections could not come fast enough.

"How important are coast-to-coast connections? The answer is, 'extremely,'" said Joe Mambretti, director of the office of strategic technologies at the University of Chicago and acting director of the new Chicago Research and Education Network (CREN) Association.

Last week, the CREN, along with the Argonne National Laboratory and Fermi National Accelerator Laboratory, announced plans to use SMDS to connect the three institutions. The network, due to be finished in a month, will support high-resolution imaging, videoconferencing and high-performance computing applications.

Yet Mambretti said his long-term plan is to use SMDS as a "stepping-stone" to Asynchronous Transfer Mode (ATM) networking because "ATM is scalable, using the same equipment." ATM will initially support speeds of 45M, 155M and 622M bit/sec. and will eventually support gigabit-speed networks.

High-speed net switches to steal show. See page 20.

Switches

CONTINUED FROM PAGE 1

tron Systems, Inc. and Chipcom Corp. on the technology curve, analysts said. They said this was manifested in SynOptic's recent posting of a 20% drop in earnings for the first quarter compared with the same period last year.

"SynOptics has been woefully inept at providing a migration path for its installed base, but this puts them on track," said Charlie Robbins, an analyst at Aberdeen Group in Boston.

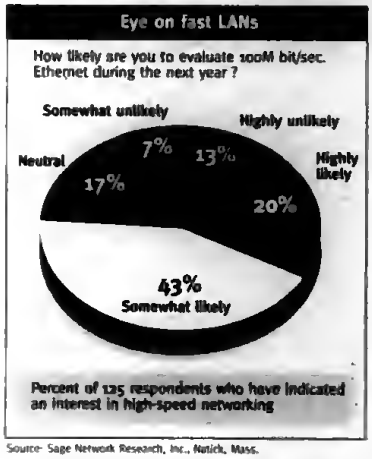
In conjunction with the SynOptics announcement, Intel Corp. will unveil the first 10M/100M bit/sec. Ethernet adapter card for DOS-based PCs. The $499 card will initially be bundled with the LattisSwitch and will be generally available in the third quarter. The switch and adapter are the first fruits of the two companies' joint development effort to develop interoperable 10M/100M fast Ethernet products, which was announced in December.

Economical choice

The combination of Ethernet switching with fast Ethernet could provide a more cost-effective means of meeting their bandwidth needs than Fiber Distributed Data Interface (FDDI) and Asynchronous Transfer Mode (ATM), users said.

"Our long-term vision is ATM, but it's too expensive at the moment. So fast Ethernet is definitely something we are interested in, and products are finally coming out that support it," said Larry Quinlan, manager of LAN services at Deloitte & Touche in Nashville.

"We're also very interested in switching because of this whole era of workgroup computing that we've entered. Put the two together, and we're very interested," be added.



Source: Sage Network Research, Inc., Natick, Mass.

SynOptics site Frank Russell Co. in Tacoma, Wash., plans to evaluate the fast Ethernet switch because "ATM is still another year or so away from prime time, and we don't think FDDI will remain a mainstream technology for long," said Bill Branson, senior network engineer.

In an effort to ease users' manageability concerns, SynOptics will also unveil an update of its LAN management platform that will allow users to configure mixed shared media and switched networks via an object-oriented graphical user interface.

"Optivity 5.0 is nice because there has definitely been a perception that when you move to fast Ethernet and switching, you kind of have to throw these [virtual networking] capabilities out the window," Branson said.

SynOptics will also show a 10M bit/sec. switch and two 10-port fiber-based switches at prices starting at $8,995. Optivity 5.0 will ship in June for $5,995.

INTRODUCING FOCUS REPORTER FOR WINDOWS™

☐ Send me information about the *New* FOCUS Reporter for Windows.

☐ Send me a FREE DEMO DISKETTE.

☐ Send me information about FOCUS for Reporting in these environments:

- ☐ DOS
- ☐ OS/s
- ☐ UNIX
- ☐ AS/400
- ☐ Digital VAX/VMS
- ☐ Digital Alpha
- ☐ Hewlett-Packard
- ☐ Tandem
- ☐ IBM MVS, VM/CMS

☐ I can't wait. Please call me.

☐ My company uses these databases:

_____

I'm planning to purchase a reporting tool in:

☐ 1-3 mos. ☐ 3-6 mos. ☐ 6-12 mos.

NAME _____ TITLE/DEPT. _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

( ) TELEPHONE _____

Information Builders

Call 800-969-INFO

All trademarks are property of their respective holders.
FOCUS is a registered trademark of Information Builders, Inc.

CW5294

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO 1305 NEW YORK, NY

POSTAGE WILL BE PAID BY ADDRESSEE

ATTN: Product Information Center
INFORMATION BUILDERS, INC.
1250 Broadway
New York, NY 10117-0582

WHY DO 4000 OF THE WORLD'S LEADING CORPORATIONS DEPEND ON FOCUS FOR ACCURATE REPORTING?

BECAUSE THEY CAN RELY ON THE RESULTS.

There's no data that FOCUS cannot access and validate, irrespective of the database or file structure the data resides in. Because even if your manufacturing data resides in a VAX Rdb file, your financials are in a mainframe DB2 file, and your sales figures are in a SQL Server file sitting on a LAN - it's all the same to FOCUS - which means you'll always have up to the minute comparisons of production, profitability, and sales in a report format that immediately identifies critical trends and pinpoints potential problems.

POWERFUL REPORTS, POWERFUL RESULTS

FOCUS can generate robust reports from any application, because its powerful underlying language can accomplish complex formats and

intuitive object-oriented Report Painter, full 3D graphics and a fool proof "Report Assist" mode that makes it easy for novice users to create meaningful reports. You also get a full featured GUI forms painter that makes it easy to quickly build and deploy finished reporting applications for standardization in any operating department.

Is it any wonder FOCUS has become the acknowledged standard for enterprise wide, mission critical reporting for these companies?

CALL FOR FREE DEMO DISKETTE

To learn more about FOCUS and FOCUS Reporter for Windows, call for a free demo diskette, or register to attend a free seminar in your area. Toll free 800-969-INFO.

Information Builders

800-969-INFO

In Canada call 416-364-2760

FOCUS and EDA/SQL are trademarks of Information Builders, Inc., 1250 Broadway, NY, NY 10001. All trademarks are property of their respective holders.

Introducing

VisualAge™

Break the code b

W

A powerful new vision of programming.™
Break the barrier. Extend the boundaries. Free yourself from the limits of what procedural programming can accomplish. Get out of the code mode and into the VisualAge.

Client/server OOP from IBM.

The ability to rapidly develop industrial-strength, object-oriented client/server applications breaks through with VisualAge, IBM's powerful new object-oriented visual programming tool. You can get the job done in the OS/2® workstation environment, with support for Windows™ coming soon. Working individually or in teams, you can produce scalable client/server applications without rewriting yesterday's programs. And you can do it with amazing speed.

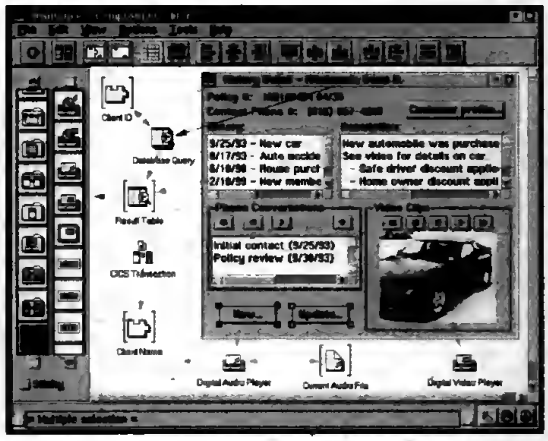
VisualAge provides access for DB2/2™ in the base product, as well as optional access to other IBM and non-IBM databases, and access to a variety of remote applications and network protocols such as TCP/IP and CICS OS/2.™ It enables development of multimedia applications and doesn't require a communications programmer for networking applications.

Recycle, don't rewrite.

VisualAge supports development approaches that reward code reuse, so you don't have to spend time writing code you've already written. It gives you prebuilt, standard-compliant objects to get you started, intuitive graphical user interface tools, and the added flexibility of a completely integrated Smalltalk object-oriented base. And it supports rapid prototyping and iterative development.

IBM and OS/2 are registered trademarks and VisualAge, DB2/2 and CICS OS/2 are trademarks of International Business Machines Corporation. Windows is a trademark of Microsoft Corporation. ©1994 IBM Corp.

arrier
ith VisualAge.



For a demonstration diskette, call 1 800 3-IBM-OS2.

VisualAge is so extensible, you can even write your own add-ons. It provides an open architecture, it's System Object Model-enabled, and it's based on industry standards.

See VisualAge for yourself. **Call 1 800 3-IBM-0S2 (in Canada, 1 800 465-7999, ext. 657)** or see your IBM representative to order or to receive a VisualAge demonstration diskette. We'll show you how easy it is to make the barriers come tumbling down.

SOFTWARE FOR OBJECT-ORIENTED PROGRAMMING.

IBM

High-speed net switches to steal show

By Stephen P. Klett Jr.
LAS VEGAS

Attendees at this week's Networld/Interop '94 show in Las Vegas will see a cornucopia of products covering the full range of networking technology. Ethernet switching and high-speed networking hardware, however, are expected to garner the most user mind share, observers said.

For example, Ungermann-Bass, Inc. and SynOptics Communications, Inc. will unveil switches based on Asynchronous Transfer Mode (ATM) and "fast" Ethernet technology, respectively. UB's ATM strategy will be based on a 16-port switch that sources said will carry an aggressive price of approximately $2,000 per port. SynOptics, meanwhile, will launch the LattisSwitch 28000 hub family, which consists of two models offering either 10 or 18 ports.

3Com Corp. will show a stackable hub platform called SuperStack that mixes Ethernet, Token Ring, SNA and Fiber Distributed Data Interface environments at prices starting at $60 per managed port. Hub, router and switching modules can be mixed and matched in a single stack, conserving valuable floor space in small workgroup and remote-office environments. 3Com will also outline its plans to provide "fast" Ethernet and ATM modules by year's end.

Vendors will team up to ease user fears about high-speed interoperability. The Fast Ethernet Alliance will demonstrate a 100M bit/sec. Ethernet network based on the 100Base-X standard using equipment from eight different vendors, including Digital Equipment Corp., Grand Junctinn Networks, Inc. and Standard Microsystems Corp. The 100VG-AnyLan Forum will hold a similar demonstration with equipment from, among others, AT&T Corp., Hewlett-Packard Co., IBM, Novell, Inc. and Proteon, Inc.

Not to be left out, ATM proponents Fore Systems, Inc., Sun Microsystems, Inc. and Cisco Systems, Inc. will show interoperable products based on the Switched Virtual Circuit ATM protocol. And Wellfleet Communications, Inc. and Proteon will conduct a Data Link Switching interoperability demonstration.

Also on tap...

Companies looking for a corporatewide scheduling package may be interested in a new version of CaLANder from Microsystems Software, Inc. in Framingham, Mass. Release 3.0 takes care of redundant directory administration by natively using the directory services built into Lotus Development Corp.'s CC:Mail, Microsoft Corp.'s Mail and Banyan Systems, Inc.'s Vines network operating system.

The systems already support Novell's messaging, but it does not currently have links to IBM Profs, the leading mainframe messaging and group scheduling system.

Other announcements will include the following:

- HP will unveil a family of low-end servers for its NetServer line called the HP NetServer LC Series. It includes three models equipped with either a 66-MHz Intel Corp. I486DX2, 100-MHz 486DX4 or 66-MHz Pentium processor; six expansion slots, including a Peripheral Component Interconnect bus master slot; and 16M bytes of internal memory. Prices will start at $2,629.
- Gandalf Technologies, Inc. in Cherry Hill, N.J., said it will unveil an Integrated Services Digital Networks-based bridge to provide remote sites with transparent access to corporate data up to 40 times faster than conventional dial-up modem connections.
- D-Link Systems in Irvine, Calif., will introduce several products, including an IPX/IP-based router, "fast" Ethernet hubs and adapters, RISC-based bridges and an Ethernet print server.

Lannet simplifies intelligent hubs. See page 63.

For installation, call 1-800-274-4707.

If you really want to understand Windows® NT, there's no better place to learn than Corporate Software's training classes. After all, our education centers were developed in association with Microsoft® to be the most comprehensive source of NT training and expertise. And now, they're even better. If you're interested in purchasing Windows® NT-Advanced Server, our bundled packages can save you over $800. For details, and help choosing the class that best meets your needs, call 1-800-274-4707, Dept. 006.

CORPORATE SOFTWARE

Now accepting enrollment at our Microsoft Certified Education Centers.

- Supporting MS Windows NT®
- Managing MS Windows NT-Advanced Server®
- Inter-networking with TCP/IP Using Windows NT
- System Administration for MS SQL Server for NT®
- Implementing a Database Design on MS SQL Server®
- Performance, Tuning, and Optimization of MS SQL Server®
- Programming for MS Windows Environment®
- Analysis and Design of Client Server Systems

Offer is good in the U.S. only while supplies last. ©1994 Corporate Software Inc.

The time has come to

distribute

the application

to every critical node

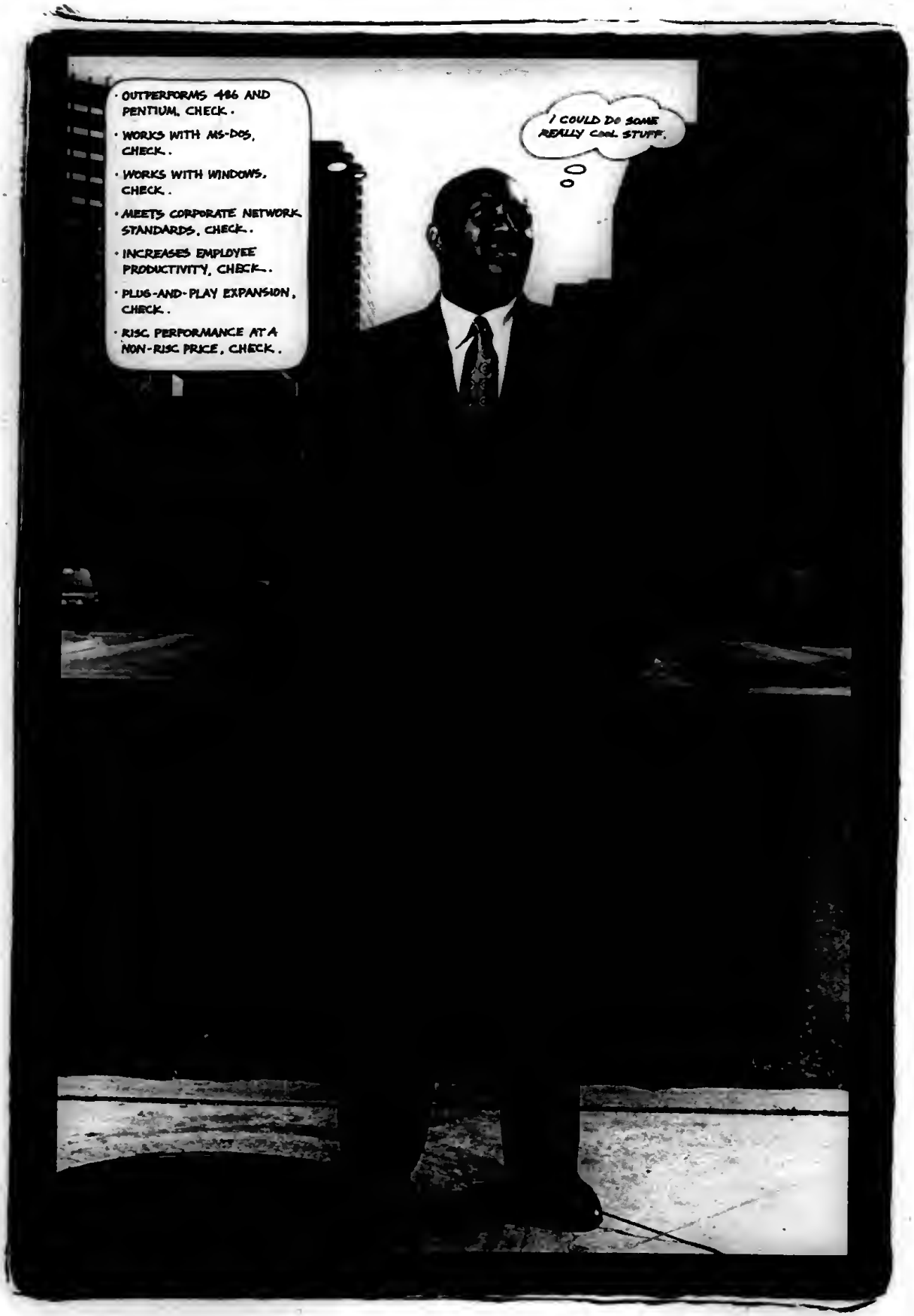
in the network.

How many times will you worry about reliability?

You won't have to worry with Isis — the only complete solution for distributing truly reliable applications. Isis delivers the reliability and scalability no one else can. And solves your most complicated distributed computing problems. So you can put your worries behind you and get on with the job.

1-800-258-0990

a wholly owned subsidiary of Stratus Computer


· OUTPERFORMS 486 AND PENTIUM, CHECK.
· WORKS WITH MS-DOS, CHECK..
· WORKS WITH WINDOWS, CHECK..
· MEETS CORPORATE NETWORK STANDARDS, CHECK..
· INCREASES EMPLOYEE PRODUCTIVITY, CHECK..
· PLUG-AND-PLAY EXPANSION, CHECK..
· RISC PERFORMANCE AT A NON-RISC PRICE, CHECK.
I COULD DO SOME REALLY Cool STUFF.

Think of it as the Macintosh for people who thought they could never have a Macintosh.

Check your preconceptions at the door.

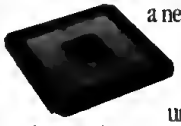
This isn't just a new family of Macintosh personal computers. It's a whole new kind of personal computer.

A new architecture. A new chip. A new standard that exceeds previous personal computing standards – yet works with DOS, Windows and Macintosh.

Introducing Power Macintosh. It's more powerful than a Pentium processor-based PC. It's more human than a Macintosh. It's the most powerful line of personal computers in the world.

The power of Apple, IBM and Motorola.

At the heart of Power Macintosh is the PowerPC™ 601 microprocessor: the first of a new family of ultra-high-performance RISC chips developed in a unique three-year collaboration between Apple, IBM and Motorola.



The PowerPC 601 has a lot of power inside it: the combined resources of IBM, Motorola and Apple

The RISC technology of Power Macintosh brings a whole new level of performance to personal computing. Software written to take advantage of its unique new capabilities, in fact, will run significantly faster than the same programs written for 486 or Pentium processor-based PCs.

Combine the power of RISC with the practical simplicity of a Macintosh personal computer, and the result is more work done in less time, with lower support costs.

The power to run MS-DOS, Windows and Macintosh software.

Many Power Macintosh configurations come bundled with SoftWindows™ from Insignia Solutions, an innovation that lets Power Macintosh run hundreds of off-the-shelf MS-DOS and Windows applications at 386 and 486 performance levels. (Of course, Power Macintosh runs thousands of Macintosh productivity programs, too.)

This is just the most recent example of Apple's commitment to making it easier for MS-DOS and Windows users to take advantage of Macintosh innovations.

The power of RISC for as little as $1,819.

These days, the whole personal computer industry is buzzing about the potential of RISC processor technology in PCs.

"My next computer will be a PowerPC. I was using Intel-based machines long before the PC was a glimmer in IBM's eye, but as Emerson said, foolishly held consistency is the hobgoblin of little minds...: It's time for a change, and the time is now," wrote Bill Machrone in *PC Week*. "That next machine will probably wear an Apple logo.... Apple appears to be a good six months ahead of IBM in terms of [PowerPC] product development and software integration."

Power Macintosh	6100/60	7100/66	8100/80
Processor	PowerPC 601	PowerPC 601	PowerPC 601
Speed	60 MHz	66 MHz	80 MHz
Memory	8MB to 72MB	8MB to 136MB	8MB to 264MB
Expansion slots	1 PDS or NuBus	3 NuBus	3 NuBus
Hard disk storage	160MB or 250MB	250MB or 500MB	250MB to 1GB
Video support	DRAM	DRAM VRAM 1MB to 2MB	DRAM VRAM 2MB to 4MB
Networking	Ethernet	Ethernet	Ethernet
Apple Price	From $1,819	From $2,999	From $4,249

All this plus built-in Macintosh PC Exchange, AppleScript, QuickTime, software TrueType fonts, 16-bit stereo sound, file sharing and more

Call 800-732-3131, extension 600, for the name of your authorized Apple reseller.

And find out about the power that will change the way you think about Macintosh.

The power to be your best.

From left: the new Power Macintosh 8100/80, Power Macintosh 7100/66 and Power Macintosh 6100/60

Introducing Power Macintosh.

Apple

Effective 3/14/94. Apple Price includes the Power Macintosh 6100/60 with 8MB of memory and a 160MB hard drive. For the sake of custom configuration, keyboard, monitor and mouse are sold separately. Unless bundled with a particular configuration, SoftWindows must be purchased separately. Retail prices may vary depending on location. ©1994 Apple Computer Inc. All rights reserved. Apple, the Apple logo, Macintosh and "The power to be your best" are registered trademarks of Apple Computer Inc. AppleScript, Macintosh PC Exchange, Power Macintosh, QuickTime and TrueType are trademarks of Apple Computer Inc. PowerPC is a trademark of International Business Machines Corporation, used under license therefrom. Windows is a trademark of Microsoft Corporation, and SoftWindows is a trademark of Microsoft Corporation and under license.

Information Builders offers Windows-based app for Focus line

By Rosemary Cafasso

Information Builders, Inc. in New York last week rolled out its first Windows-based application development and report writer tool for its Focus product line.

The company's goal is to do a better job of opening up the host-based data to end users, a much needed move that was a long time coming, customers and analysts said.

Information Builders' Focus line consists of host databases and the Focus fourth-generation language tool, as well as an expert system and object-oriented development platform. Launched in 1976, Focus has been used to create about 200,000 host-based applications at about 8,000 customer sites, according to the company.

Focus Reporter for Windows allows users to create reports and design query applications to access data in Focus systems with a graphical, menu-driven format. The software also comes bundled with an Open Database Connectivity driver and interfaces to Microsoft Corp.'s SQL Server, IBM's DB/2 and Oracle Corp. and Teradata Corp. databases. The Focus development language is the behind-the-scenes driver to the application development.

British Gas PLC, a longtime Focus user, is converting several hundred beta copies of Focus Reporter for Windows to production versions. It plans to make the tool a key component of the company's "standard architecture for corporate data access," said Roxane Harker, manager of office systems.

Harker said British Gas is staging Focus mainframe data on a mix of Unix server platforms and creating data warehouses for users to access with Focus Reporter.

"We need to get users access to corporate data by pointing and clicking," Harker said. She said she expects this tool to help fill "too big a gap" between the time a user requests data and when information systems is typically able to provide it. "If they have a problem on Monday morning, they can't wait a few weeks" for IS, Harker added.

Warehouse on the way

Information Builders is readying an IBM OS/2-based data warehouse that it plans to roll out by year's end, sources said. David Feldstein, vice president of the company's micro products division, confirmed that a warehouse project is underway but declined to provide details.

Other offerings

Information Builders offers other Windows-based query and executive information system tools, but the tools do not target report writing, a key function for pulling data out of host systems.

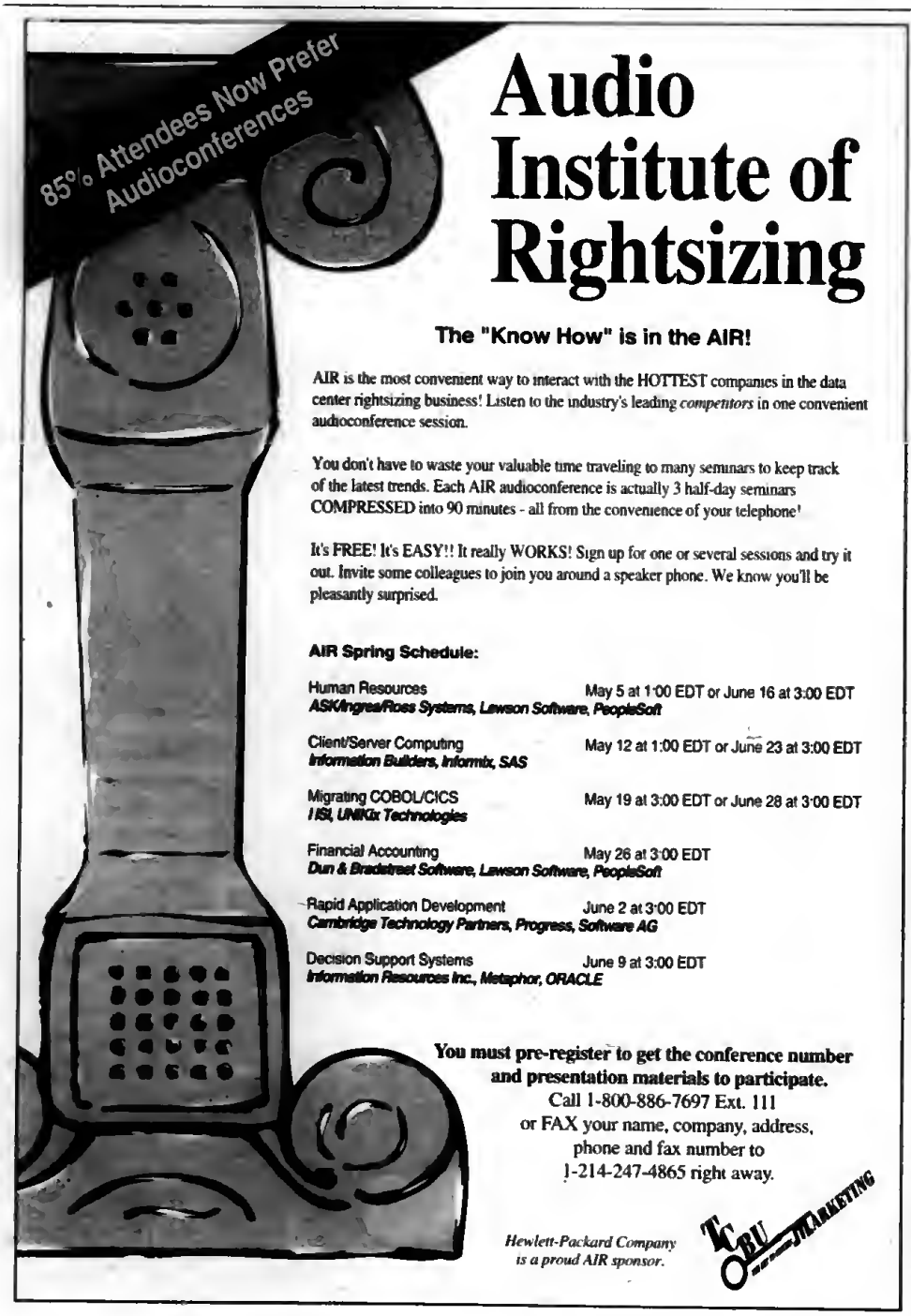
The company also sells an OS/2-based report writer front end to Focus but said there is little demand for it.

"The risk was that users would start picking up PC tools and not use Focus," said Judith Hurwitz, president of Hurwitz Consulting, Inc. in Watertown, Mass. "So this is to keep the installed base from saying, 'Let's look at the PC tools.' "

One Focus Reporter beta user has worked with other desktop development tools but said the Information Builders tool was the better choice for an end-user data query application he was developing called Goal Manager.

"It's more powerful than some of the other front ends," said beta-test user Steve Lasher, senior systems analyst at the Atlanta Region Information Services department at the Federal National Mortgage Association, which also uses Gupta Corp. tools and Microsoft's Access. "Behind it is a full language, so you don't have to write macros or use a third-party product with it like [Microsoft's] Visual Basic," Lasher said. "Everything is done in Focus."

Focus Reporter for Windows is shipping now at a list price of $395.



Client/Server Development Has Finally Turned The Corner.

ADW
BUSINESS DISTRICT

When you travel down the road of client/server development, at some point you're ready to begin building large, high-volume, mission-critical applications. Leading the way is KnowledgeWare's® Application Development Workbench® (ADW®), the industrial-strength solution for developing and deploying mission-critical client/server applications.

With the ADW toolset, applications are developed right the first time, since planning and analysis ensure that they're based on actual business requirements. Intelligent, flexible information management tools deliver the benefits of client/server to your development organization. By accommodating team-based development. By providing security, versioning, and change management. And by controlling the efforts of multiple workgroups and offering an enterprise-wide repository.

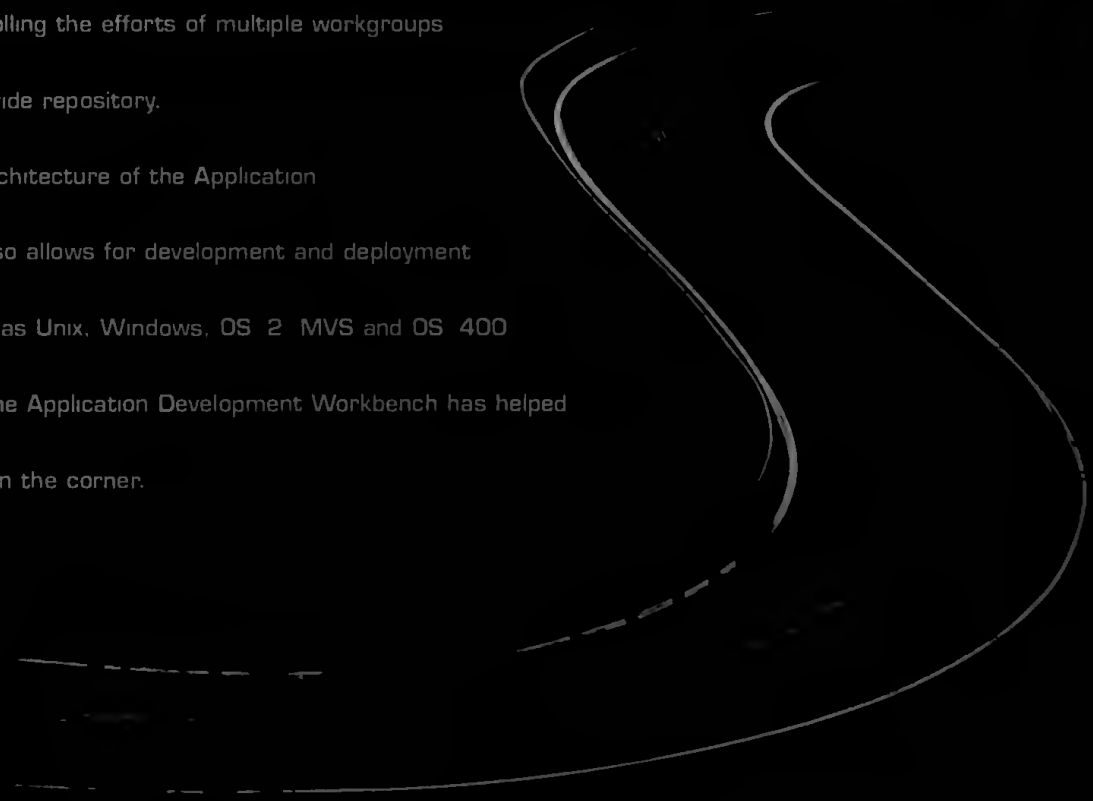
The open, scalable architecture of the Application Development Workbench also allows for development and deployment on multiple platforms, such as Unix, Windows, OS/2, MVS and OS/400. Call today to find out how the Application Development Workbench has helped thousands of companies turn the corner.

SOLUTIONS AT WORK

KnowledgeWare®

©1994 KnowledgeWare, Inc. KnowledgeWare, Application Development Workbench and ADW are registered trademarks of KnowledgeWare, Inc. All other trademarks belong to their respective holders.

1-800-338-4130



Licensing

CONTINUED FROM PAGE 1

petent programmers. Opponents call it regulatory overkill and deem it inappropriate for a fast-paced field in which software is written by teams.

"Occupational licensure is a sham," said John Aynesworth, a compnter professional in West Bend, Wis., and an attendee at the recent Computers, Freedom and Privacy conference in Chicago.

"The only purpose of occupational licensure is to restrict the labor supply so that those people who hold the license can charge monopoly prices enforced by the state, period," Aynesworth said. "Any appeals to the public safety or pnblic interest are a smoke screen."

No accepted standard

Many informatioo systems managers are also critical of licensing. "It's impossible for the government to create a licensing test dynamic enough to keep up with technology," said John Shiels, vice president of IS at JM Hnber Corp., a manufacturer in Edison, N.Y.

Given the debates over structured development methodologies and rapid prototyping, there is no commonly accepted standard for software engineering, be added.

Another tricky issue is defining programmers. Do they include end nsers creating spreadsheet macros? Does just the programming team leader need to be licensed? How do you license overseas programmers working on critical software for use in the U.S.?

Many proponents argue that software engineering is fundamentally not so different from civil engineering, in which bridge builders must be liceosed.

"I expect some form of mandatory competency validation is inevitable, at least for safety-critical software, because society will want some control over the professioo," said Robert J. Melford, chairman of the public policy committee at the Washington-based IEEE Computer Society, which is studying the issue.

Safety-critical systems include those running nnclear power plants, air-traffic control centers, chemical factories and medical devices.

"So the qnestion is, should we let the politicians do it in a crisis atmosphere, or should we do it ourselves in a way that is responsive to tbe needs of our profession and serves the public welfare?" asked Melford, a computer security coosultant.

Robert J. Melford *of the IEEE Computer Society: 'Society will want some control over the profession ... [but] should we let the politicians do it ... or should we it ourselves?'*

A joint task force of the IEEE Computer Society and the Association for Computing Machinery (ACM) is studying such issues as skills, education, reeducation and standards of professional practice. The target date for a report is October 1995.

Meanwhile, the ACM's Special Interest Group on Computers and Society has a task force studying certification (which is voluotary) and licensing (which is mandatory), according to Donald Gotterbarn, associate professor of computer and information sciences at East Tennessee State University in Johnson City. He said that report is due in Juoe 1995.

Inevitable and vital

Neither association has endorsed licensing — in fact, many members of the freewheeling and largely unregulated software community are strongly opposed to it — so the low-level studies could fizzle. But Gotterbarn said he believes licensing is not ooly inevitable hut also vital to protect consumers from programmers who produce shoddy work.

The issue was last raised in 1991 when the New Jersey State Assembly passed a hill to regulate and license "software designers" to protect tbe public from unscrupulous developers.

The hill was killed in the state senate after fierce opposition developed from a coalition of IS managers, vendors and independent programmers.

IS managers vigorously opposed the New Jersey hill as either a misguided effort to regulate businesses or a state hid to raise mooey through annual license fees, said James B. Webber, president of the Omieron consortium of IS managers in Mountain Lakes, N.J.

"AT&T, for example, has about 5,000 IS professionals in New Jersey, and they threatened to move every IS professional out of New Jersey if tbat hill had passed," Webber said.

He added that there is no compelling oeed for such legislatioo because there is no evidence of "a bunch of computer consultants out there ripping off the public." He said market forces and lawsuits can take care of any isolated problems.

Critics are also worried about how state-based licensing would work, given that much of today's software is written in multiple states and even overseas. "The idea of putting computer professionals through state-by-state licensing is just absurd on the surface," said Murray Turoff, a computer science professor at the New Jersey Institute of Technology in Newark.

More concerns

Other common objections include the concern that licensing individuals will not address the fact that most software is built by teams, as well as the concern that licensing tests will become outdated.

"Can you imagine the effort needed to create a fair, across-the-board test? It would be brutal. You'd be updating that test every week," Webber said.

The Institute for Certificatioo of Computing Professionals (ICCP), which nffers broad-based certification testing and opposes state licensing, altered its policy last montb to acknowledge that licensing may he inevitable.

"We still don't condnne licensing, hut if a regulatory body insisted on licensing, we'd want them to adopt oor program rather than have 50 different state programs," explained George R. Eggert, executive director of the ICCP in Des Plaines, Ill.

Over the next decade, experts said, the profession may see a bodgepodge of approaches to software quality, including state licensing, certificatioo, regulation of specific industries and quality standards from the International Standards Organization and the Software Eogineering Institute.

In addition, the marketplace is responding to the quality issue with vendor-specific certification such as Novell, Inc.'s Certified NetWare Engineer designatioo.

The fledgling National Associatioo of Communication Systems Engineers in Denver is scheduled to begin certification testing in mid-July.

A model test

Critics claim that programmer licensing will only stifle innovation and reward good test-takers. But Donald Gotterbarn, chairman of one task force studying the issue, said his model for licensing computer professionals addresses many common objections. Gotterbarn, an associate professor at East Tennessee State University, said the model is drawn from licensing schemes used for paramedics and engineers. It includes the following elements:

- **The mandatory** licensing standard would be national in scope, created by computing professionals and administered by state governments.
- **A four-year college** degree would be required to assure that practitioners will have come in contact with current best practices.
- **Practitioners would** have to apply their knowledge by working as an apprentice to a licensed computer professional for at least three years.
- **The license would expire** every five years, thus requiring a commitment to reeducation to keep practitioners up on changing technology.
- **Different levels of licensing** would reflect skills and areas of competence. The highest level would be for safety-critical software.
- **Sanctions would be** imposed on those who violated the standard of best practices and/or the code of ethics. This would be a counterweight to the schedule and budget pressures that can lead to shoddy products.

Can You Pass the TEST ?

1. What management concept is concerned with only performance deviations outside allowable control limits?

A. Quality circles
B. Scientific management
C. Management by exception
D. Management by objective

2. Which of the following is not a program control to assure data accuracy?

A. Cross-footing
B. Echo-checking
C. Control total
D. Limit and reasonableness test

3. Which of the following correlation coefficients most likely reflects an error in computation?

A. -0.60
B. 0.00
C. +0.60
D. +1.20

4. Which of the following graphic aids would be least useful in monitoring a project?

A. A pie chart
B. A Program Evaluation and Review Technique chart
C. A milestone chart
D. A critical path chart

5. The topology of a network can be each of the following except:

A. Star
B. Packet
C. Bus
D. Ring

5. B 4. A 3. C 2. B 1. C Scoring

Source: Sample questions from the Institute for Certification of Computing Professionals, Des Plaines, Ill.

PeopleSoft began shipping client/server applications before most people knew client/server existed.

It's a track record that's hard to beat – especially when you consider that most application vendors are still new to client/server. They're still making promises, announcing plans or experimenting with client/server technology. They're simply not prepared to support you in a client/server production environment.

PeopleSoft began shipping client/server business applications in 1989. And as client/server technology has evolved, we've responded with new releases and functionality. Today, companies worldwide are benefiting from our six years of client/server experience.

What's more, only PeopleSoft applications give you a choice of six RDBMS platforms. So you can use the same applications whether you're upsizing to a mainframe, downsizing to a LAN, or rightsizing to anything in between. You'll find that PeopleSoft delivers the power and innovation of applications developed specifically for client/server, plus the ease of use that comes from our familiar Windows interface.

That's why PeopleSoft client/server financial and human resource applications are the choice of 322 companies, worldwide. (As of January 1994.) With more signing up every day. Get the facts from our new white paper: *Client/Server Business Solutions*. For your free copy, and a schedule of our client/server seminars, please call 800/947-7753.

PEOPLESOFT

Run with it.

© 1994 PeopleSoft, Inc. All other company and product names are trademarks of their respective owners.

IN THE RACE TO BE #1 IN DISTRIBUTED SYST
IN THE RIGHT

In today's race to provide control of your distributed environment, some system management vendors simply offer tactical products on as many platforms as possible. This leaves you to worry about integration between platforms, and across your network, as well as protection of your legacy investments.

CROSS PLATFORM ENVIRONMENT

At Legent, we know that the promised benefits of distributed computing included better economies of computing and the availability of data on all nodes within the network. If your systems management solutions don't span the network, and lack of integration causes more staff demands, you haven't achieved either result.

It's post time ladies and gentlemen. Enter XPE, the Cross Platform

EMS MANAGEMENT, ONE VENDOR IS HEADED DIRECTION.

Environment that runs in step with your evolving system and network needs. With XPE, you can choose the system and network management tools most appropriate for your present needs, yet retain the freedom to change them to meet your evolving distributed requirements. Moreover, only XPE provides full client/server functionality, while supporting your legacy environment.

XPE provides the effective management of mission-critical applications across systems, networks and platforms, so you'll have the control and integration that was once found only in centralized environments. And, of course, all of this is backed by the industry leader in support. Legent. Let us show you how Legent's XPE can meet your management needs while improving the bottom line of your business.

*Call **1-800-676-LGNT** today for a copy of our whitepaper on XPE and distributed systems management.*

LEGENT

THE EXPERTS IN DISTRIBUTED SYSTEMS MANAGEMENT

LEGENT Corporation, 575 Herndon Pkwy., Herndon, VA 22070-5226

Briefs

No more poison pills

Shareholders at its annual meeting last week forced **Advanced Micro Devices, Inc.** to drop its poison-pill defense against takeover attempts. AMD adopted the policy in 1990 when its stock was at a particular ebb.

Aldus boosts image

Seeking to expand its product line with a catalog software developer, Seattle-based **Aldus Corp.** has acquired **Image Club Graphics, Inc.**, a privately held firm in Calgary, Alberta. Aldus gets all Image Club shares, its products line, mail-order catalog business, source code and trademarks for a onetime cash payment of $3.4 million.

Kurzweil sees loss

Kurzweil Applied Intelligence, Inc. said it will announce in June results for the fiscal year ended Jan. 31. The firm said a review of its revenue recognition policies and practices may result in a substantial loss.

SHORT TAKES **Kendall Square Research Corp.** is asking NASDAQ to reconsider a decision to delist its stock. . . . **Microsoft Corp.**'s former president, Jon Shirley, 55, was elected chairman at **Mentor Graphics, Inc.** . . . **Autodesk, Inc.** founder John Walker resigned last week to focus on other ventures. . . . **Media Magic, Inc.** in Palo Alto, Calif., appointed former Novell, Inc. executive Gerald Machi chief executive officer. . . . Cheryl L. Handler, co-founder of **Thinking Machines Corp.** in Cambridge, Mass., resigned as chairman. . . . Former **Apple Computer, Inc.** executive William V. Campbell, 53, has joined Menlo Park, Calif.-based **Intuit** as president and CEO. . . . **Standard & Poor's Corp.** said it may downgrade certain Apple debt due to increased uncertainty that Apple will achieve profitability levels reflecting its current rating.

PC players up share power

Lotus seeks giant increase in allotment; Microsoft plans 2-for-1 stock split

By William Brandel

■ Against a backdrop of 1980s-like mergers and consolidations in the PC software industry, Lotus Development Corp. and Microsoft Corp. are looking to increase the number of shares each puts into circulation.

An increased share allotment is significant because it could signal that a software company is gearing up for an acquisition. Because software companies do not carry as high a physical asset value as other companies, software firms tend to perform significant transactions with stock shares rather than cash.

A Lotus source said the company has not yet decided what exactly it would do with the shares, but it is considering an acquisition or a stock split.

However, the likelihood of Lotus pulling off a major acquisition anytime soon has fallen with the price of its stock — from a 52-week high of 86½ to below 60 last week. Lotus' price/earnings ratio tumbled from 36 for fiscal 1993 to under 28 in some stock analysts' 1994 projections. Normally, companies with large price/earnings ratios tend to buy companies with smaller ratios.

Wall Street analysts who were calculating a Lotus acquisition into their projections just one week ago are now beginning to doubt whether Lotus could buy a major concern such as Novell, Inc. or Borland International, Inc.

"I don't think you're going to see Lotus do any major acquisitions over the short term," said Timothy McCollum, an analyst at Dean Witter Reynolds, a Wall Street investment research company located in New York.

McCollum noted that at Lotus' current stock price, its market capitalization is at $3 billion, while Novell's stands at $10 billion. "That pretty much sums up the situation right there," he said.

Awaiting the green light

Lotus' board is seeking shareholder approval to put 205 million shares of stock on the market.

Currently, Lotus has approximately 45.5 million common shares outstanding, and its board wants to put up to 200 million shares of common stock and 5 million new preferred shares on the market.

Lotus shareholders will vote on the issue at the annual meeting on May 25.

Microsoft has announced that it will perform a 2-for-1 stock split, slated for May 6. With nearly 285 million shares outstanding, Microsoft is moving to place 570 million shares into circulation.

The company said it is doing so to make its stock more attractive to smaller investors. A stock split does not give the company any extra leverage to perform a stock-based acquisition.

Periscope down

Lotus' and Microsoft's price/earnings ratios ain't what they used to be

	1993	1994*	1995*
	34	27	23
	28	23	19
	NM	NM	74

*Estimated NM: Not meaningful

Source: Salomon Brothers, Inc., New York

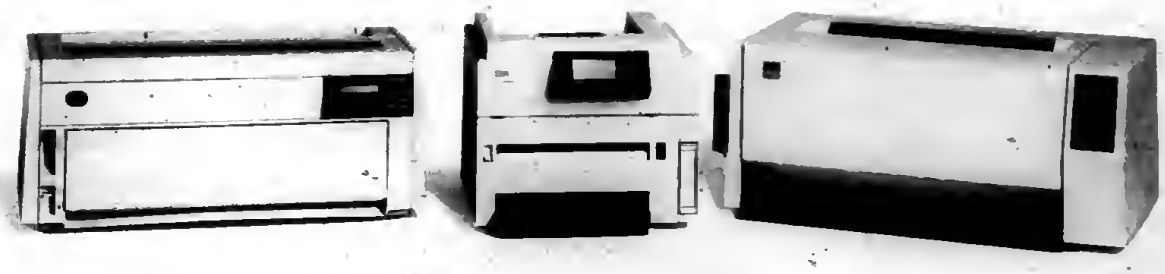
1994 first-quarter earnings

Company	Revenue January through March	Percent change from 1993	Net income January through March	Percent change from 1993
Advanced Logic Research, Inc.				
Amdahl Corp.	$379M	-0.5%	$7.1M	102%
AST Research, Inc.				
Cheyenne Software, Inc.	$27M	92%	$10.3M	82%
Boole & Babbage, Inc.				
FileNet Corp.	$38.8M	12%	$2.4M	11%
Gupta Corp.				
IBM Credit Corp.	$2.1B	24%	$59M	1%
Informix Corp.				
KnowledgeWare, Inc.	$39M	51%	$0.8M	103%
Legent Corp.				
Parallan Computer, Inc.	$3.5M	-46%	$0.31M	-89%
PeopleSoft, Inc.				
Powersoft Corp.	$25M	160%	$2.9M	165%
Ross Systems, Inc.				
Silicon Graphics, Inc.	$376M	39%	$35M	73%
Stac Electronics				
Storage Technology Corp.	$336M	-0.88%	-$20M	NM
Stratus Computer, Inc.				
Symantec Corp.	$69.9M	9%	$7.2M	198%
Tandem Computers, Inc.				
Unisys Corp.	$1.7B	-11%	$60M*	-77%
Wang Laboratories, Inc.				

*After a $7.7M charge for costs associated with the repurchase of debt NM = Not meaningful

It's been a rough-and-tumble, mixed-up quarter for technology stocks, with a decided accent on the unexpected. A number of firms posting profits, among them **Lotus Development Corp.** and **Netframe Corp.**, saw their stocks take some strong hits. While **IBM** put a glow back in some investors' cheeks by recording a much-better-than-expected first-quarter profit of $392 million, **Digital Equipment Corp.** blew the wind out of its own sails with a stunning $183 million loss.

What you get out of it



depends on what you put into it.

The quality of print from an IBM® printer or typewriter depends on the quality of the ribbon, toner or ink that you put into it. And we should know. Lexmark, a former division of IBM, now an independent company, develops and manufactures IBM personal printers and typewriters as well as IBM toners, ribbons and inks. The result is perfect compatibility.

Take our 4039 LaserPrinter, for example. A printer this good requires a toner that delivers precise character generation, high yields and industry-leading reliability. We design each of our supplies this way – in tandem with the machine that they fit.

Remember, when it's time to replace your IBM ribbon, toner or ink, buy IBM supplies by Lexmark to keep your machine printing like the day you took it out of the box.

To locate the dealer nearest you, to order IBM supplies, or to receive your free catalog, please call 1-800-438-2468, ext. 120.

IBM Supplies by
LEXMARK™
Make Your Mark

IBM Supplies by Lexmark are manufactured under the International Standard ISO 9002 approved quality process.
Federal government agencies call 1-800-258-8575 for further information. In Canada, call 1-800-633-7662.

IBM is a registered trademark of International Business Machines Corporation in the United States and/or other countries and is used under license. Lexmark is a trademark of Lexmark International, Inc. ©1994 Lexmark International, Inc.

IBM SUPPLIES BY LEXMARK. TAKE A CLOSER LOOK.

Even the strongest company has a soft underbelly.

"I want to know if my company has a soft underbelly."

❑ I'd like more information on your Business Recovery Consultation Services.

❑ I'd like more information on all of the Business Recovery Services offerings.

Name _____

Company _____ Title _____

Industry _____

Address _____

City _____ State _____ Zip Code _____

Phone ( ) _____

05 CW

NO POSTAGE
NECESSARY
IF MAILED IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 20 EDISON, N J

POSTAGE WILL BE PAID BY ADDRESSEE

IBM BUSINESS RECOVERY SERVICES
P.O. BOX 3053
EDISON, N J 08818-9869

You think everything's under control. You have a strong balance sheet. No debt. Sales and productivity are up. But haven't you overlooked something?

While your information systems are becoming more sophisticated, and your ever-changing environment of client/server, LAN and end-user systems, host systems and networks is making you more competitive, there is a downside.

As you become more dependent on technology, you also become more vulnerable. What happens if a disaster strikes? How quickly could you recover? How much would be lost (in dollars, sales or customers)? How prepared will you be, or not be?

And remember, a systems breakdown can be caused by a variety of unforeseen events: hurricanes, floods, infrastructure disasters, telecommunications failures, virus infections, even simple human error.

To protect your business, and ensure your peace of mind, we recommend teaming up with IBM's Business Recovery Consultation Services to create a well-defined recovery strategy.

Nobody knows the business better than we do or will work harder for you. We'll help you develop a comprehensive business recovery program that includes risk management and disaster avoidance, recovery strategies and a customized recovery plan.

We'll do a Business Impact Analysis for you to determine what losses you would face in a disaster, the costs and how to minimize a disaster's effects. And we'll take into consideration your data center as well as the often overlooked distributed systems of PCs and LANs.

We'll also do a Customer Environment Analysis™ that looks at your entire Information Systems environment—hardware, software, networks and workflow.

Most important, we have the expertise and experience to deal with any type of environment or equipment (and it's not necessary for you to have IBM equipment). So whether you have a traditional-data center or distributed systems, or a combination of both, including high-end, midrange or personal computers, we can help you create a plan based on your needs *and* your budget.

To find out how IBM's Business Recovery Consultation Services can reduce the unnecessary risks you face every day, send in the Business Reply Card or call 1-800-599-9950.

This is your opportunity to make sure your business is as invincible as it appears to be.

IBM

Business Recovery Services

Provided by Integrated Systems Solutions Corporation™

IBM is a registered trademark and Customer Environment Analysis is a trademark of International Business Machines Corporation.
Integrated Systems Solutions Corporation is a trademark of the Integrated Systems Solutions Corporation. ©1994 IBM Corp.

No guts

Microsoft's eleventh-hour withdrawal of a controversial provision in its Chicago nondisclosure agreement late last month speaks volumes about why the company is so feared and hated by its peers in the industry. It also says plenty about its competitors' lack of resolve to do anything about it.

As we reported last week, Microsoft inserted language in Chicago nondisclosure forms sent to several large software firms prohibiting those companies from working on competing products. The agreement specifically cited the OpenDoc object technology standard, the Windows emulation software called Wabi and Novell's UnixWare (but strangely, not OS/2). In order to see Chicago, the document said, a developer couldn't work on any of those products for three years.

You have to marvel at Microsoft's sheer audacity in trying to foist such a blatantly anticompetitive restriction on independent software developers at a time when the company is under a Justice Department microscope for allegedly monopolistic behavior.

But you also have to cringe at the sheep-like behavior of independent software vendors, most of whom apparently went along quietly with this outrageous requirement. They reportedly included Lotus and Borland, who supposedly still wield some clout in this industry, and several other software firms our reporters contacted. In fact, if WordPerfect hadn't raised a fuss and reporters hadn't started asking Microsoft about the legal implications of all this, you wonder if Microsoft wouldn't have gotten away scot-free with this one.

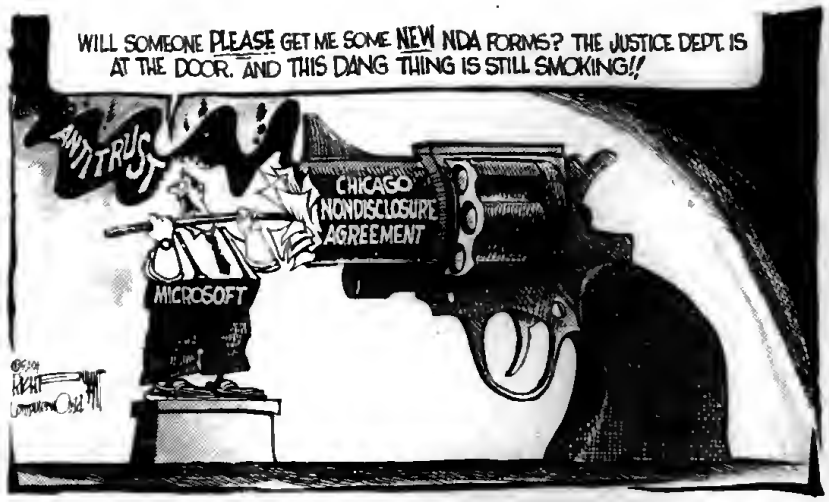
Come on, software companies. Is it really all over? Is there really no hope that any desktop operating system technology can amount to anything unless it bears a Microsoft logo?

Rewind to 1987 and IBM's announcement of the PS/2s with the Micro Channel Architecture. Seeking to regain control of the desktop standard, IBM announced that it had filed for dozens of patents on Micro Channel and dared anyone to try to clone it.

Competitors kicked Micro Channel's tires, took a look under the hood and said, "No, thanks." They wouldn't bother. Over the next two years, a panicked IBM first dropped its threats and then began begging competitors to clone Micro Channel. But it was too late. The standard, and IBM, were the laughingstocks of the industry.

OK, Windows isn't the same thing. But the principle isn't all that different. Wouldn't it have been neat if the biggest independent software vendors took a look at the Chicago NDA and just said no, we won't bother with Chicago? Nah. There's too much money to be made in the Windows business to let principles get in the way.

Paul Gillin, *Editor*
Internet: *pgillin@cw.com*



In the eye of the beholder

Isn't it funny how Novell, one of the chief complainants against Microsoft's "predatory trade practices," is looking more and more like the Redmond giant?

If it purchases WordPerfect and Quattro Pro, Novell will have major applications and operating systems in its kingdom; I wonder if it also has Chinese-wall builders on staff. And what about how Novell redesigned NetWare so it will only run on servers that are running DR DOS? Sounds predatory to me.

David Michael Bernard
New York

Credit is due

I appreciated "Credit industry employs E-mail to address dispute resolution woes" [CW, April 4]; I do wish to make a couple of clarifications, however.

The success of this new process cannot be completely credited to GE Information Services (GEIS). Although GEIS provided the central network, I/O Express, Inc., an Anaheim, Calif.-based firm, is the leading software provider for the PC software interface. GEIS also provides a PC interface that competes with that of I/O Express, but all companies quoted in the article are using the Automated Data Verification System, the software provided by I/O Express.

L. Curtis O'Reilly
Anaheim, Calif.

E-mail vendors are staying the course

"Small players retreat from E-mail onslaught" [CW, April 4] did a good job covering the trend toward commoditization in the E-mail market but failed to mention that some of the smaller players in the overall E-mail market will continue to develop and own large pockets of the marketplace.

CE Software has no intention of abandoning its 1.1 million users or its leading position in the Macintosh market. QuickMail will continue to evolve and improve. (Meanwhile, Lotus and Microsoft are essentially giving up on Macintosh users. Microsoft even went so far as to scrap its Macintosh mail server.)

CE Software is realistic about its chances of taking on Microsoft and Lotus head-on on the PC side, but we will continue to be tenacious in our own markets.

Ford Goodman
President and CEO
CE Software, Inc.
West Des Moines, Iowa

While we appreciate the coverage of our company in "Small players retreat from E-mail onslaught," we were very upset with the implication that Da Vinci will stop selling its Email product.

You quote me accurately as saying, "When you're dancing with elephants, the best thing to do is get off the dance floor or sell them dancing shoes." Unfortunately, the story goes on to comment that this strategy may cause some users to switch their E-mail systems. To make matters worse, you follow with a quote from a Da Vinci Email user saying how he would hate to change from Da Vinci but may have to if the product is not developed and upgraded.

This alarmed and misled several Da Vinci customers into thinking that we plan to discontinue or no longer develop Da Vinci Email. This is patently untrue.

Da Vinci's long-term strategy has always been to add a suite of mail-enabled groupware products to our product line. It would be corporate suicide to continue to compete head-on with any of the huge E-mail elephants. Instead, our long-term goal has always been to deliver mail-enabled products that take advantage of the leading messaging products.

I would appreciate the opportunity to assure *Computerworld* readers that Da Vinci will continue to build the best E-mail product for NetWare and will continue to fully support the product going forward.

Bill Nussey
President and CEO
Da Vinci Systems Corp.
Raleigh, N.C.

■ Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor in Chief, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail: 279-6273; Internet: letters@cw.com. Please include a phone number for verification.

COMPUTERWORLD

Editor in Chief
Bill Laberis
Editor
Paul Gillin

News Editor
Maryfran Johnson
Sections Editor
James Connolly
Assistant News Editor
Patricia Keefe
Assistant Sections Editor
Johanna Ambrosio
Technical Editor
Charles Babcock
Senior Editors
Elisabeth Horwitt
Networking
Craig Stedman
Large Systems
Ed Scannell
PC Software
Michael Fitzgerald
Mobile Computing
Rosemary Cafasso
Client/Server Software
William Brandel
PC Software
Senior Writers
Melinda-Carol Ballou
Lynda Radosevich
Mary Brandel
Staff Writers
Stephen P. Kletti Jr.
Jaikumar Vijayan
New Products Writer
Lisa Davidson
Research Coordinator
Stefanie McCann

Features Department

Senior Editors
Joseph Maglitta, Corporate Strategies
Lory Zottola Dix, In Depth
Allan E. Alter, Management
Michael L. Sullivan-Trainor, CW Guide
Garry N. Ray, Firing Line
Associate Editors
Jodie Haze, Careers and Marketplace
David B. Weldon, Management
Assistant Editor
Derek Slater, Scorecard
Research Coordinator
Kevin Burden
Assistant Researcher
Erin Callaway, Resource Center
Chief Copy Editor
Anne McCrory
Assistant Chief Copy Editor
Christina Aicardi Maguire
Senior Copy Editors
Kimberlee A. Smith
Jill Zolot
Copy Editors
Ellen Fanning
Michelle J. Keyo
Jay F. Rizoli
Kimberly Gilliard
Michelle Grabon
Design Director
Nancy Kowal
Senior Graphic Designer
Tom Monahan
Design Assistant
Janell Genovese
Graphic Designers
Stephanie Faucher
Mary Beth Welch
Graphics Specialist
Jose E. Bruzual
Cartoonist
Rich Tennant
Office Manager
Linda Gorgone
Editorial Assistants
Lorraine Witzell
Connie Brown
Aleksandra Skulte
Rights and Permissions Manager
Sharon Bryant
Computerworld Client/Server Journal
Alan Alper, Editor
Managing Editor of Special Projects
Catherine McCrorey
News Bureaus
Mid-Atlantic
Thomas Hoffman, Senior Correspondent
(201) 967-1350
Washington, D.C.
Mitch Betts, National Correspondent
(202) 347-6718
Gary H. Anthes, Senior Correspondent
(202) 347-0134
West Coast
(415) 347-0555
Joan S. Bozman
Senior West Coast Editor
Mark Halper
Kim S. Nash
Senior Correspondents
Chris Flanagan, Editorial Assistant
Midwest
Ellis Booker, Senior Editor
(708) 827-4433
Pacific Northwest
Stuart J. Johnston, Senior Correspondent
(206) 641-7770
Main Editorial Office
Box 9171, 375 Cochituate Road
Framingham, Mass. 01701-9171
(508) 879-0700
TDD (800) 428-8244
MCI Mail: 279-6273
CompuServe: 76537,2413
Subscriptions, (800) 669-1002

The network rules

Eric Harslem

The past decade has seen dazzling growth in technology. More computing power sits on the average desk than was available in the computer room of most universities a mere 20 years ago. Faster servers, larger drives and more networking performance continue to be offered to MIS professionals.

It is time that we as an industry pause to assess our accomplishments with the understanding that we succeed or fail based on one question: Are we really making the information manager's job any easier?

A boost in performance doesn't actually reduce the repetitive tasks that are involved in keeping the network running.

A recent survey by market research firm International Data Corp. revealed that nearly 50% of the cost of keeping networks up and running arises not from hardware but software and ongoing support and services. The reality is that LANs may be getting less expensive, but they're not getting any less complicated; quite the contrary. Rapid technology change and network complexity place MIS managers in the unfortunate position of being managers of technology rather than managers of information.

Although vendors benefit from rapid technology changes, their customers often do not. Much of the difficulty in ensuring that networks deliver on their promise lies with vendors. Rapid technological change only complicates the network manager's job and too often does little for his or her organization. The network manager often must use valuable time and resources to validate the new technology before implementation, only to discover that the technology has changed again.

In addition, if LAN administrators spend 70% of their time babysitting the network, then a boost in performance doesn't actually reduce the repetitive tasks that keep the network running.

Nor does it prevent systems errors from periodically locking up or crashing a large network such as one at a major hospital or banking institution. These are real-world problems that MIS professionals face on a minute-to-minute basis.

It is time the industry set a few ground rules for the future of network computing, including the following:

- The hardware vendor's job is incomplete if it fails to account for the network as an evolving entity.
- While most vendors approach the problem of "uptime" strictly from a technology standpoint, holding themselves accountable only for the reliability or the hardware simply isn't enough.
- Where installation and ongoing support are concerned, it is mandatory that responsible vendors stop passing the buck and start providing the services MIS managers are demanding.

As an industry, we can't afford to act like a 600-pound gorilla and bully users into submission. Nor can we continue the finger-pointing among hardware, software and networking vendors. Our objective should be singular: To provide users with a simplified, hassle-free networking experience.

It's time we turned the tables and let the network serve the customer.

Harslem is senior vice president at the Dell Computer Corp. product group.

Software deconstruction

Esther Dyson

Consolidation is all the rage in the software business right now. Many once-independent companies are merging with others in mostly vain efforts to compete more effectively. When tying up with one giant, a company automatically becomes an enemy to the others and has less chance to see its technology proliferate. Instead of combining with a single large company, you can spread your genetic material around through many companies if you package it as technology modules rather than as a whole product.

Take the case of Verity Corp., founded in 1988 as a spin-off of Advanced Decision Systems, a military supplier. Its major customers/benefactors were the government security agencies that quickly recognized the value of its high-level text tools.

Basically, Verity technology went a step further than traditional search-and-retrieval systems and managed not only the retrieval of text by topic but also the construction of a mostly hierarchical structure of concepts. For example, the topic "France" contains references to Paris, Charles de Gaulle, croissants, Lyons, Bernard Attali and perhaps Jerry Lewis. That enables effective searching for topics that might not be explicitly mentioned but rather assumed as context.

Moreover, the "table" in the furniture category is recognized as being different from the "table" in the models category, and so on. Underlying all this is a powerful text-search engine that indexes text and maintains information about the number, location and proximity of pairs of the words within each document.

For a long time, Verity maintained a powerful position with the leading mainframe-style approach in text tools. Its technology was expensive, required expert users and provided huge benefits. Last year, the company was almost acquired by Frame Technology, which ran into problems of its own. As a result, Verity's top executives, Mike Pliner and Cliff Reid, departed, and the board hired Philippe Courtot, former CEO at CC:Mail, to run the company as an independent entity.

Packaging technology in modules allows a company to spread its genetic material through many companies.

CC:Mail, of course, was the first industrial-strength E-mail company to understand the implications of client/server computing. It divided its line into a server product and a client package that could run with any E-mail back end. But then it was acquired by Lotus, and it no longer was as hospitable to all — CC:Mail's server of choice is the Notes back end. Now, Courtot is applying the same pre-Lotus CC:Mail approach to Verity.

The new form of Verity's tools is a tool kit for building modules called Information Agents, which can be incorporated into other vendors' applications or operating systems or installed by a corporate user as a general server capability for a variety of clients. This allows Verity to remain a friend to all vendors as long as its technology is better (or at least available sooner) and cheaper than what they could build.

By turning its large-scale, monolithic application into a set of modules, it can continue to maintain its identity as a company, allowing its technology to live in productive symbiosis with companies that would otherwise behave as predators.

The moral of this story is that while you might have to pay for Verity's technology, smart vendors can copy its approach for free. It's the right approach for the future in which only a few giants will survive — and a few other companies will benefit by filling the cracks, not with applications but with properly packaged technology modules.

Dyson is president of Edventure Holdings, Inc. in New York. She welcomes readers' thoughts and can be reached on the Internet at edyson@eff.org.

HEY, IT'S YOUR VISION.

WE'VE SIMPLY FOUND A WAY TO MAKE IT WORK.

You can choose to use it. You can choose to ignore it. You can shape it to your business, and not your business to it.

It's the computing you've demanded all along. True network computing. It is servers with mission-critical level security. It is servers that serve more quickly and more cost-effectively than anyone else's. For the workgroup. For the department. For the enterprise. It is an operating environment with networking designed-in.

It is desktops and servers with networking designed-in. It is a scalable architecture that lets you add power by simply adding power modules.

It is an operating environment so mature financial institutions move trillions of dollars on it. It is thousands of applications for both servers and desktops. It is an ability to work collaboratively with anyone, anywhere on the network. Around the office. Around the country. Around the world. In real-time. It is high-bandwidth enterprise workstations at prices that start at $2,995.

It is a way to integrate the new systems you add, and leverage the mainframes and personal computers you already have. It is consulting and operations services that not just support, but that transfer expertise.

It is a $4.3 billion company that uses what it makes, and runs itself on this kind of open, client-server computing. It is experience that comes from selling more UNIX systems than any other company. It is network management tools to truly is the co...

It is the Solaris™ operating environment, SPARCstation™ systems, SPARCserver™ systems, SunNet Manager,™ 16,000 UNIX® experts, and 8,500 applications. It is happening today. In companies such as Chase Manhattan Bank and McCaw Cellular. And around the world. It is what is truly significant in computing today.

And it is demonstrably better. Let us prove it to you. 1-800-426-5321, ext. 750. Or use Mosaic to enter the Internet at http://www.sun.com/

Sun

The Network Is ...

©1994 Sun ...

PENTIUM MAXIMUS.

Sounds like the folks who test PCs for a living had to tighten their old safety belts when they tested our latest Pentium OmniPlex systems. Besides calling it, "the best performing PC we've ever seen," PC *Magazine* said "on our benchmark tests, the OmniPlex was unmatched," and, "this EISA/PCI-based OmniPlex is truly an impressive machine."

We gave our OmniPlex both a PCI and a EISA bus, a 1GB SCSI II hard drive, and a PCI local bus video benchmarked at 50 million Winmarks.[1] To put it a bit differently, we squeezed every single available ounce of performance out of the Pentium processor.

Call today to order your very own Dell OmniPlex. You'll have one of the sweetest Pentium systems on the face of the planet.

But don't quote us. Quote *PC Magazine*.

DELL® OMNIPLEX™ 566 PENTIUM™ 66MHz SYSTEM

$6,977

BUSINESS LEASE[2] $251/MO.

32MB RAM

192MB MAX RAM

5 EISA EXPANSION SLOTS AVAILABLE (3 EISA MASTER 2 PCI/EISA MASTER)

2MB VIDEO RAM

ULTRASCAN™ 15ES MONITOR (15" CRT, NI)

COMBO DISKETTE DRIVE

NEC TRIPLE SPEED CD-ROM

MS DOS® 6 2MK ROSOFT® WINDOWS™ 3 1/MOUSE

ORDER CODE #500015

90MHz PENTIUM OMNIPLEX SYSTEMS AVAILABLE NOW

DELL

TO ORDER, CALL

800-545-1579

HOURS MON-FRI 7AM-9PM CT SAT 10AM-6PM CT SUN 12PM-5PM CT

CANADA: 800-668-3021 MEXICO CITY: 228-7811 KEYCODE 811HK4

[1]Source: PC Magazine 4/12/94. [2]Prices valid in the U.S. only. Some products and promotions not available in Canada or Mexico. [3]Business leasing arranged by Leasing Group, Inc.

The Intel Inside and Pentium Processor logos and Pentium are trademarks of Intel Corporation. MS-DOS and Microsoft are registered trademarks and Windows is a trademark of Microsoft Corporation. Dell disclaims proprietary interest in the marks and names of others. ©1994 Dell Computer Corporation.

Trackball alternative shows promise

New kind of mouse for portables has no moving parts, requires no cleaning

By Michael Fitzgerald

■ Users who run into trouble with dirty mice, particularly on portables with their smaller trackballs, will soon have an alternative that is as simple as letting your fingers do the pointing.

Cirque Corp. is scheduled today to release its GlidePoint finger mouse, a 3- by 3-in. touch-screen device that replaces the standard mouse. The 2-in. wide, touch-sensitive screen lets the user glide a finger across the screen to move the cursor. To "click" on the screen, a user simply taps it lightly. To double click, the user taps twice. A tap and a hold lets users drag icons or other on-screen objects. GlidePoint also has conventional mouse buttons at its base.

The user glides a finger across the touch-sensitive screen to move the cursor, taps once to click and taps and holds to drag an icon

"There are no moving parts, so it doesn't get all dirty or gunked up," said James O'Callaghan, Cirque's vice president of marketing and administration, in reference to a problem that occurs both in regular mice and portables that use trackballs.

Vendors acknowledge the problem with mice and trackballs and have always instructed users to clean them regularly.

Important or not?

A spokesman at Toshiba America Information Systems, Inc. termed the problem a minor one. He said Microsoft Corp. is developing a new mouse, due out in late June, that promises greater ease of use.

Trackball dirt "is not something that's a make-or-break issue, but they do become unresponsive after a while, in my experience," said Victor Mutnick, corporate vice president of information systems at New York Life Insurance Co.

Mutnick said he was lukewarm to something like GlidePoint. "Just hooking up a mouse or having to plug something in the port, that's always a bugaboo" with users, Mutnick said.

At the same time, he said his users often complain about trackballs and find them less responsive than mice. "If it's better than a trackball, it could be good for us," Mutnick said.

Some users were more interested in GlidePoint's approach.

Michael J. Henderson, PC coordinator at James River Corp.'s Neenah Technical Center in Neenah, Wis., also said that in his experience, built-in trackballs frequently lose their responsiveness.

"New technology does need to be developed, and this technology sounds like it could be heading in the right direction," Henderson said.

GlidePoint can be positioned wherever the user finds it most comfortable and will fit on a plane tray table next to a notebook. It is Microsoft mouse-compatible and connects through the mouse port. It works with IBM-compatible PCs but not Apple Computer, Inc. Macintoshes.

Analysts generally were pleased by the notion of a finger mouse, some because they personally do not like to use trackballs.

No more mice

Others said they like GlidePoint enough to swear off the trackball's more efficient cousin, the mouse.

"I will never use a mouse again," said Tim Bajarin, president of Creative Strategies Research International, Inc. in San Jose, Calif.

Andrew M. Seybold, editor in chief of the "Outlook" newsletters on computing, dissented, saying users might not be good enough with their fingers to use the device. They also might not like its cables.

GlidePoint will retail for $99 and will be distributed initially only through Ingram Micro, Inc., although Salt Lake City start-up Cirque is talking directly with retail chains, according to O'Callaghan.

Jeffrey Henning

Proprietary software beat goes on

Microsoft's OLE 2.0 was supposed to enable component software to work with any OLE-compliant application. Yet the first major component applet is Shapeware's Visio Express for Microsoft Office. That's right, for Microsoft Office. Wait a minute, you say. Isn't the whole point of OLE 2.0 that you will be able to drop applets into any application? What gives here?

What gives is shrewd marketing by Shapeware. Office is one of the best-selling software packages. As a result, resellers love Office and are delighted to have an aftermarket product they can sell to Office purchasers. For resellers, Visio Express is the software equivalent of "would you like fries with that?" In other words, it's a great way for resellers to make a little extra margin.

To back up for a minute, Visio Express is the applet version of Visio 2.0, Shapeware's drag-and-drop drawing program that enables even nonartists to prepare diagrams and charts. Visio Express provides only the basic functionality of Visio; it does not run as a stand-alone application, and all file management has to be handled by the host application (the container, in OLE parlance).

Of course, Visio Express has a street price of less than $50, compared with about $120 for Visio 2.0. Now, Visio Express for Microsoft Office will in fact run with any OLE-compliant application; it just runs better with Office applications (Excel, Word and PowerPoint).

Look and feel

Shapeware has optimized Visio Express by customizing its interface to closely follow the Office look and feel, integrating similar menu structures and similar icons as those found in the suite. Visio Express is accessed by clicking an icon in Word, Excel or PowerPoint; the interface is so similar that a user wouldn't even notice the application had changed if it weren't for the Shapeware splash screen. Behind the scenes, Visio Express has been extensively tested with the Office applications, while it might interoperate less seamlessly with other container applications.

Vendors such as Shapeware have hidden the complexity of OLE 2.0 from users, but the 400 API calls that they must access to implement OLE functionality leave plenty of room for incompatibilities in different applications' implementations.

For the near term, expect OLE compatibility

Henning, *page 44*

PC standards development

Central administration may become PC reality

By Elisabeth Horwitt

A 2-year-old desktop management standardization effort that is expected to bear fruit later this year would potentially allow LAN administrators to manage PC configurations and problems centrally, rather than in person.

The Desktop Management Task Force (DMTF) vendor consortium plans to release a developer's kit, for its Desktop Management Interface (DMI) in July. The kit will be quickly followed by commercial implementations from key PC hardware and software vendors.

DMTF

Easy data access

DMI promises LAN administrators the ability to easily extract "internal systems management data from a variety of manufacturers," such as the version number of the operating system or software package, or CPU or disk utilization levels, and load it into a network management platform, said Jill Huntington-Lee, a principal at Brandywine Network Associates, a Cinnaminson, N.J., consultancy.

The information could then be used in applications ranging from inventory management to troubleshooting to user administration.

At The Solomon R. Guggenheim Museum, for example, "One of the Holy Grails of DMI is being able to do away with physical inventorying," said Richard Roller, director of information systems at the New York museum. Existing packages tend to monitor only certain brands and types of PC elements.

Microsoft Corp., Novell, Inc., Hewlett-Packard Co., IBM, Intel Corp., Compaq Computer Corp. and AST Research, Inc. have committed to providing software that

PC standards, *page 42*

Tool lets managers 'play out' scenarios

Systems thinking used to model environment, follow long-term effects

By Garry Ray

To most managers, it is obvious that the world does not function in isolation.

Change the speed of the production line, and you change inventory. Change inventory, and you change expectations on the sales force. If the sales force changes, so might customer relations.

So, even though it is clear that actions have consequences, it is less clear how these interacting effects might be predicted, simulated and adjusted.

An evolving category of software tools promises to solve these kinds of problems. One such tool is the $695 Ithink from High Performance Systems, Inc. in Hanover, N.H.

Offered under the rubric of "management flight simulators," "modeling tools" and other names, tools such as Ithink generally use the techniques and approaches of "systems thinking."

Popularized by management gurus such as Peter Senge of MIT, the approach assumes that changes in one part of a system — whether a management system or a social system — will have intended and unintended consequences upon other parts of the system. Most important is that these effects will take place over time. That is, an action may seem desirable in the short term but produce a cascading series of problems that become obvious only over a long period of time.

The goal of systems thinking — and thus of Ithink — is to allow users to plan for and anticipate these effects.

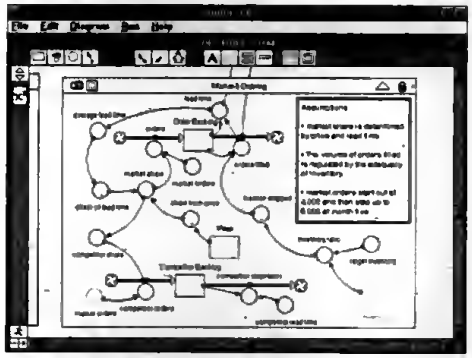
Set up a model

Ithink allows users to build and simulate a system of almost any possible type — management, manufacturing or social — with a small number of graphical and quantitative tools.

Most important are the three essential building blocks: stocks, flows and converters.

Stocks are places where results, actions and the like, are collected. They can be used to represent sales, inventory or anything that can be quantified. (In fact, a stock can be used to represent an abstraction such as "optimism.") Flows are used to fill and drain stocks. Converters generally contain the numeric variables or functions that convert an input from a flow, stock or another converter to an output.

To use these tools in Ithink's visual modeling environment, a manager would typically place a combination of stocks, flows and converters on the software's model construction layer. A first attempt at modeling is likely to produce some conceptual mistakes, but these can be quickly and easily fixed with Ithink's editing tools.



Ithink from High Performance Systems *enables managers to view intended and unintended consequences of a business plan under consideration*

Go with the flow

Having created a schematic model of workflow in a manager's department, for example, the next step might be to add a few charts and tables to track the time and money spent on some day-to-day activity, such as sales calls. Other variables might include the number of salespeople soliciting new projects and the revenue derived from existing contracts.

Once this model has been refined and enhanced, Ithink allows it to be run, and the results of various scenarios are placed in charts, tables or both. An array of controls makes it possible to construct scenarios within a varying range of inputs (for example, to show contract revenue from two to 10 salespeople on staff). By altering the model, managers can get a good sense of what might happen in the real world.

Ithink does present a bit of a learning curve because it requires users to adopt the lingua franca of systems thinking advocates. In addition, the unconventional metaphor of Ithink modeling, and the reliance on moderate quantitative skills, may present some difficulty. However, a library of helpful documentation — including the introduction to Systems Thinking — does alleviate some of these concerns.

In the end, it is the ability to quickly model a business scenario and run a simulation with many different variables that makes Ithink a valuable and unique addition to any manager's arsenal.

PC standards

CONTINUED FROM PAGE 41

will let their systems be managed by DMI-compliant systems.

Microsoft, for example, will provide DMI management for the Chicago version of Windows and Windows NT. The company will also provide patches to add DMI support to legacy Windows systems via on-line bulletin boards. Microsoft's Hermes software distribution and configuration application will incorporate DMI when it ships, a company spokesman said.

A conversion utility developed by DMTF will enable SNMP-based management systems to collect information from PC products that support the DMI interface. Intel plans to provide DMI compliance for its LANdesk inventory and software distribution applications by year's end.

Novell is working on a NetWare Distributed Management System inventory management application that will collect data from DMI systems, a company spokesman said.

Intel, AST and Compaq are among the hardware companies that have committed to providing DMI-based management of their desktop systems.

Unix vendors are working with X/Open Co. to provide a version of DMI to go on their systems, Huntington-Lee said. They hope to have an initial version by year's end.

Search for definitions

A group of database and software application vendors plan to start a DMTF working group to define management information files for their products.

The DMTF seems to be working hard to ensure that vendors adhere closely to the management information file specifications for collecting information about a particular type of device or system, said David Goodman, a network systems manager at the Guggenheim.

He said he hopes this will prevent the problem that surfaced with SNMP, in which vendor "extensions" precluded one vendor's management system from managing another vendor's device, he added.

Cyrix adds DX2 chip to 486 upgrade family

By Michael Fitzgerald

■ Cyrix Corp. recently released a version of its 386-to-486 Upgrade Microprocessor, designed to upgrade 33-MHz 386DX systems to the performance level of a 33/66-MHz 486DX2 class processor.

Users who have upgraded their systems with Cyrix processor upgrades in the past said they are pleased with the results.

"I figure we probably bought another two years [for] those systems" by upgrading, said Glenn Loo, manager of utility informatioo systems for the city of Palo Alto, Calif. Loo said the upgrade move has been cost-effective, particularly since the upgrade took some 10 minutes, including chip replacement and a software upgrade.

Eric LaFortune, regional electronic office systems coordinator at a major West Coast oil company, said his shop has updated all of its upgradable PCs with this and other Cyrix microprocessors.

LaFortuoe said the ease of installation was a major plus because it spared the company from seoding someone to a site to put in a new motherboard for a PC it was going to upgrade.

"A lot of companies don't have the expertise on hand to do that," LaFortune said. "I think it avoids administrative costs in some circumstances."

The new chip taps into the 33-MHz 386DX market, which was the best-selling 386DX chip.

Analysts said the Cyrix strategy for upgrading has proved effective.

"For companies that make a big financial commitment to a given platform, upgrades make a tremendous amount of sense," said Dean McCarron, an analyst at Mercury Research in Scottsdale, Ariz. "If it buys even another year, it defers an investment that more than offsets the upgrade cost."

The Cx486DRX2 33/66 microprocessor costs $399. With the upgrade chip's release, Cyrix cut prices on its other upgrade processors. Pricing for the 25/50-MHz unit for 25-MHz 386 systems was cut to $349, while the 20/40-MHz unit, aimed at 16-MHz and 20-MHz 386 systems, now costs $299.

Cyrix said it shipped more than 100,000 upgrade processors in its first six months.

Analysts noted that Cyrix is shipping a 33/66-MHz 486DX2 class processor as an upgrade part before it is part of the regular product line. Cyrix officials said they will ship a mainstream part in the secood quarter and add a 40/80-MHz part in the third quarter.

Cyrix's Peotium-class M1 processor is targeted for later in the year.

Microprocessor prices to fall

By Jaikomar Vijayan

As Intel Corp. attempts to move the market toward Pentium, there are tndications that microprocessor prices could fall rapidly during the next few months.

Users can expect to see significantly cheaper Intel I486-based systems hitting the market by September — or even before that, according to some analysts.

"Microprocessor prices are going to drop much faster than anticipated," said Tony Massimini, senior market analyst at In-Stat Research, Inc. in Scottsdale, Ariz.

"There is going to be a lot of pressure on prices with Intel trying to break the $2,000 barrier for Peotium-based desktops," he said.

> "There is going to be a lot of pressure on prices with Intel trying to break the $2,000 barrier for Pentium-based desktops."
>
> Tony Massimini, In-Stat Research

Done deal

In fact, the receot developments in the microprocessor industry, including IBM's recently inked chip manufacturing agreement with Cyrix Corp., have led analysts to believe that 486 chip prices could fall by as much as 25% to 40% by year's end.

For instance, a 66-MHz 486DX2, oow selling for just under $350, will cost little more than $210 by the fourth quarter, Massimini predicted.

The impact on system prices, though less dramatic, could be qutte significant, said Randal Giusto, an analyst at BIS Strategic Decisions in Norwell, Mass. As Intel attempts to make Pentium the PC processor of choice, vendors could start cutting prices rapidly on 486-based PCs — especially if Pentium prices continue to drop.

Reaching the top

According to Massimini, this is likely to be the "year of peak revenues for the 486" before the PC market migrates to Pentium.

While the IBM/Cyrix agreement is not expected to contribute directly to any immediate price drops, the presence of a competitor with manufacturing capacity in the 486 arena could spur more rapid price cuts from intel, according to some analysts. IBM/Cyrix Pentium clones are not expected for at least another year.

Intel shifts into OverDrive

I486-to-Pentium upgrade strategy takes shape

By Jaikumar Vijayan

Intel Corp. is using pricing to lure users of its 1486 architecture into upgrade strategies based on its Pentium processor.

Intel recently rolled back prices oo its 66- and 55-MHz OverDrive processors by at least 20%, even as it announced a new upgrade processor for 486SX users priced at $249. A Peotium OverDrive processor is expected hy year's end.

The pricing moves occur at a time when there are predictioos of general decline in microprocessor prices (see story above).

"Overall, [Intel] wants to move everything to Pentium. This is part of their strategy for users who are not quite ready to make that move yet," said Tooy Massimini, senior market analyst at Io-Stat Research, Inc. in Scottsdale, Ariz.

The intelSX2 OverDrive is a clock-douhling processor that cao be used to upgrade 16-, 20- and 25-MHz 486SX-based systems.

Typical applications such as WordPerfect Corp.'s WordPerfect for Windows and Microsoft Corp.'s Microsoft Works run between 52% and 60% faster with the upgrade processor, according to Intel.

The oew processor targets home and small business users and is Intel's entry-level upgrade chip in its current OverDrive strategy.

intel expects to annouoce the P24T, a top-of-the-line Peotium OverDrive processor for 486SX and above systems, by year's end.

Doubting users

However, users are not entirely sure they need it yet.

"I would coosider a Pentium opgrade depending on the application I needed it for and only if there was no one else [in the company] who could use a 486," said Roy Gregory, manager of personal computing at Scrivner, Inc. in Oklahoma City.

Meanwhile, there are indications that upgrade processor prices could drop further as 486 prices begin to fall.

According to Massimini, pressure from Intel's agressive Peotium pricing and competitioo from companies such as IBM Microelectronics, Advanced Micro Devices, Inc., Cyrix Corp. and Texas Instruments, Inc. could cause prices on some 486 chips to fall throughout the rest of the year.

92 PEOPLE IN HOUSTON CAN CUSTOMIZE MICROSOFT OFFICE FOR YOU.

Henning

CONTINUED FROM PAGE 41

to be like PCMCIA compatibility: something incomplete but gradually getting better. The bitter side of suites is that each suite has its own interface personality. Applets designed to work smoothly with Office will require different icons and naming conventions to blend in with Lotus' SmartSuite or the "NovellPerfectland Come-From-Behind Suite."

Applets such as Visio Express will eventually need to be chameleons, adopting the look and feel of the host application. That type of integration is far in the future; vendors aren't even planning for it yet. Visio Express is a revolutionary product, and it heralds the changes that component software will bring. For one, it transforms the role of suites.

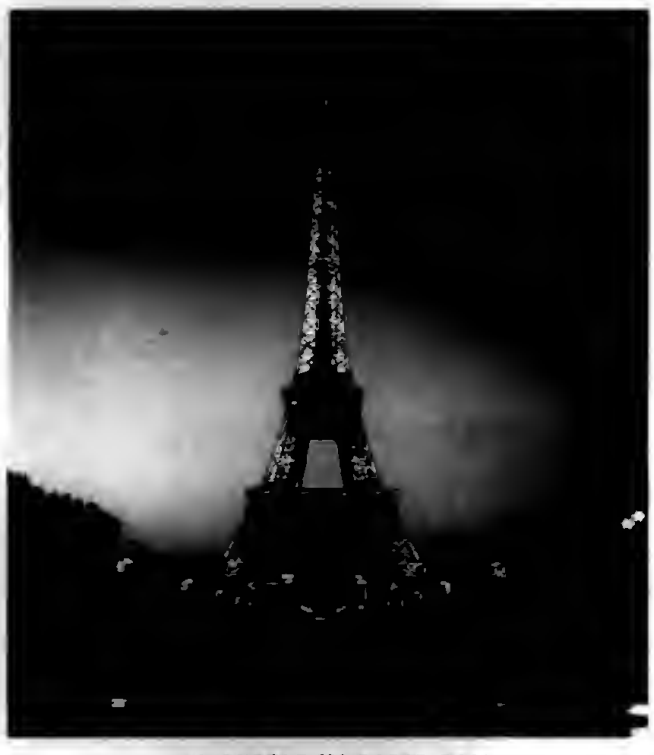
By calling its applet Visio Express for Microsoft Office, Shapeware is helping transform suites into platforms. As a result, from now on, when you consider which suite to choose, you will have to factor in which has the most applets written for it. You can bet Bill's billions to hageis that Office will emerge as the platform of choice for OLE 2.0 component software.

Office is the only suite supporting OLE 2.0, giving it a head start. Office outsells the other suites combined, giving it the most attractive feature of a platform — a large installed base. Finally, Microsoft understands better than its competitors how to encourage independent software vendors to support a platform, as it has demonstrated with DOS and Windows. In fact, Microsoft recently announced it will help distribute independent software vendors' Office applets. Yes, Microsoft owns the operating system market; now it will own the suite-platform market above that.

> Microsoft understands how to encourage independent software developers to support a platform.

But with OLE 2.0 promising to make it easier to customize applications, how can we object?

Henning is launching BIS Strategic Decisions' newsletter, "User Frontiers," designed to help developers produce more usable software. He can be reached at 649-6654@MCImail.com.



173 PEOPLE IN PARIS CAN
HELP YOU AUTOMATE YOUR BILLING PROCESS.

Briefs

Holiday Inn picks Apple

Apple Computer, Inc. said **Holiday Inn Worldwide** has ported its reservation system to the Power Macintosh for front-end access at its Amsterdam reservation center supporting Europe, Africa and the Middle East. The hotel chain had been using Motorola, Inc. 68000-based Macintoshes. Holiday Inn said it eventually plans to convert to the Power Macintosh at other locations.

Sound board introduced

Media Vision has announced a three-dimensional, PC-compatible sound board that is wave table-upgradable. The board includes 16-bit stereo sound and offers interfaces for Sony, Panasonic and Mitsumi CD-ROM drives for around $360.

IBM cuts ThinkPad prices

IBM PC Co. cut prices between 9% and 13% on its ThinkPad 350 line, bringing the base price to $1,699, and the price of a color version with a 250M-byte hard drive to $2,399. Analysts indicated that the price cuts are an effort by IBM to clear inventory as it prepares to release a follow-on version of the 350.

Symantec offers upgrade

Symantec Corp. released Act 1.1 for the Hewlett-Packard Co. 100LX palmtop. Retail pricing for the product is $129.95, and current users can upgrade for $39.95.

Apple pushes multimedia

Apple released a variety of new multimedia-oriented products last week. Included in the announcement were the Apple Multimedia Kit for Macintosh, the Multimedia Kit for Windows, AppleDesign Powered Speakers II and the Apple CD 300e Plus, an external CD-ROM drive. The multimedia kits cost $479 and include speakers, CD-ROM players and CD-ROM titles. The speakers cost $85, and the CD-ROM drive, which can play 3- or 5-in. disks and has a 256K-byte cache, costs $369. Products will be available starting this month, with the Multimedia kit for Windows and the speakers not available until June. The CD-ROM drive will be available in Europe and Asia this month but will not reach the U.S. until summer.

Digital adds notebooks

Digital Equipment Corp. fleshed out its notebook offerings last week by adding four **Intel Corp.** 1486/33MHz-based monochrome and passive-matrix color models to its line. The notebooks, which range from $1,699 to $2,599, are manufactured by **AST Research, Inc.** A Digital spokesman said the company's own notebooks would be available before the end of the year.

Intel expands processor line

Intel is strengthening its strategy to provide current 1486 users with an eventual migration path to its new Pentium architecture. The company last week expanded its OverDrive upgrade processor family by introducing a $249 CPU upgrade for users of its 486SX-based systems, even as it reduced prices by more than 25% on the 66-MHz DX2 OverDrive processor. The Pentium upgrade processor is expected by year's end.

Intel builds chip plant

Intel said it will build a $1.3 billion, 1.5 million sq. ft. microchip factory in Chandler, Ariz. Due to begin production in early 1997, the plant will produce chips on a 0.25 micron process. The plant will employ 2,000.

Sharp improves LCD

Sharp Corp. announced a new type of thin film transistor LCD that does not need backlighting. While a Sharp spokeswoman emphasized that it does not have a set plan to bring the technology to market, the advantages would be a thinner, lighter screen that draws less power and has a wider viewing angle.

PCs aid voter ID

In the months leading up to its first all-race parliamentary elections, the **Independent Electoral Commission** in South Africa used computers from **AST Research** to produce temporary voter registration cards. Three hundred Premmia-based configurations from AST were used by the commission to process identification documents for an estimated 2 million voters without identity papers. Another 100 systems were used as mobile units in remote regions of the country.

CD-ROM growth

An estimated 100 million CD-ROMs were manufactured worldwide in 1993, according to a report by the **Optical Publishing Association.** This represents a 150% growth over the previous year. A vast majority of the revenue came from the high-ticket database, professional and corporate products market segments. Multimedia game, educational and reference products contributed to less than 25% of the total revenue, according to the industry association.

Desktop agreement

Radius, Inc. has appointed **Portrait Display Labs** the exclusive marketer of its proprietary color pivoting displays for Macintosh and Windows desktops. Under terms of the agreement, Radius will also receive an undisclosed equity stake in Portrait. The agreement expands an existing business relationship between the two firms under which Portrait licensed Radius' pivoting display technology for sale in the Windows marketplace.

[redacted]

Pinnacle Micro, Inc. has introduced Tahoe-230, a portable 3½-in., 230M-byte magneto-optical drive.

According to the Irvine, Calif., company, the 1.8-pound product is a fully rewritable optical drive that connects to any SCSI interface or parallel port.

Tahoe-230 is backward compatible, automatically detecting and reading 128M-byte media.

An optional battery pack offers 3½ hours of typical use.

Tahoe-230 costs $999 for Macintoshes and $1,199 for PCs. The battery pack costs $199.

▶ *Pinnacle Micro*
(714) 727-3300

Samtron Displays, Inc. has introduced the SC-528UXL, a 15-in. Star Power monitor.

According to the La Mirada, Calif., company, the product features a 15-in. flat-screen display and Energy Star certification.

The SC-528UXL provides multiscan color display with high resolutions of 1,280 by 1,024 pixels and a refresh rate of 60Hz.

The product also offers digital on-screen controls and VESA power-saving capabilities.

The SC-528UXL monitor costs $499.

▶ *Samtron Displays*
(213) 802-8425

Lexmark International, Inc. has introduced the IBM LaserPrinter 4039 Plus with MarkVision, a Windows application that provides integrated network printer management capabilities.

According to the Lexington, Ky., company, the product lets users install and set up 4039 Plus printers, detect printing problems, view the printer configuration and save instructions for special printing jobs.

The product includes standard emulations for enhanced PCL 5 and PostScript Level 2 for maximum compatibility with industry standards.

Prices start at $1,749.

▶ *Lexmark International*
(606) 232-2000

Parallel Storage Solutions has introduced Quick/2Install, an OS/2 installation tool.

According to the Elmsford, N.Y., company, the product can install the OS/2 operating system in less than 15 minutes using a ¼-in. cartridge backup system.

Quick/2Install runs on three disks and comes equipped with OS/2 Version 2.11 on a ¼-in. cartridge tape.

The product can be used with the company's standard and minicartridge ¼-in. cartridge systems, the company said.

Quick/2Install costs $299.

▶ *Parallel Storage Solutions*
(914) 347-7044

Micro Express has introduced the Micro Express MicroFlex-PCI/VL/100, a PC designed to run graphical programs faster.

According to the Santa Ana, Calif., company, the base configuration for the system includes 16M bytes of RAM, 420M bytes of integrated drive electronics, a fast hard drive with a VESA caching controller (1M byte) and 256K bytes of RAM cache.

The product also includes a 15-in. noninterlaced video monitor, a Peripheral Component Interconnect video accelerator card with 2M bytes of RAM, 3½- and 5¼-in. high-density floppy drives, DOS 6.2, Windows 3.1, a 101-type keyboard and a mouse.

A Windows tutorial package is also included.

Micro Express MicroFlex-PCI/VL/100 costs $2,999.

▶ *Micro Express*
(714) 852-1400

KnowledgePoint, Inc. has introduced Performance Now for Windows, an interactive software program that allows managers to write employee performance reviews.

According to the Petaluma, Calif., company, the product includes an employee log for tracking an employee's performance between appraisals, a human resources advice feature and a language-checker.

Performance Now provides 26 performance elements that cover areas including quality, quantity, judgment, teamwork, communication skills and problem solving.

Performance Now for Windows costs $169.

▶ *KnowledgePoint*
(707) 762-0333

Objects, Inc. has introduced For Your Eyes Only, a data-security utility for PC users to secure their data.

According to the Danvers, Mass., company, the product combines a data encryption algorithm with a laser fingerprint on a floppy disk to create an unbreakable level of security for DOS-, Windows- and OS/2-based PCs.

For Your Eyes Only can protect single files to entire disks, and through a modem, establish a secure channel for transmitting information among host and remote sites.

For Your Eyes Only costs $99.95.

▶ *Objects, Inc.*
(508) 777-2800

FoxPro versions to speak French, German and Unix

By Cars A. Cunningham
PARIS

In an attempt to win over as many dBase users as possible, Microsoft Corp. will release French and German language versions of its FoxPro database this spring.

Version 2.6, which will be available for DOS and Windows in standard and professional editions, includes features to help novice users of XBase — users of dBase-compatible languages — access data and build applications. The upgrade also incorporates enhancements that encourage users of Borland International, Inc.'s dBase database to switch to FoxPro.

The new versions will be followed by FoxPro 2.6 for The Santa Cruz Operation's SCO Unix and Xenix operating systems in June, FoxPro 2.6 for PowerPC-based Macintoshes in September and a 32-bit upgrade for Windows NT in December, Microsoft said. These versions will be available in English, French and German.

Version 2.6 aims to help new XBase users by including "assistants," or dialogue boxes that walk users through the creation of components such as tables, queries and applications, the company explained.

To lure Borland users, Microsoft added more than 50 dBase commands to the FoxPro programming language, making it easier for developers familiar with the language to use FoxPro while offering greater compatibility with data stored in dBase formats.

No runtime

The French and German standard editions include the FoxPro development database capabilities without the ability to create runtime applications. They will be available for DOS and Windows this month at the promotional price of $152 in France. Pricing varies in each country. Pricing after the promotion, which ends June 30, was not announced.

The professional edition will be available for both platforms in both languages in May. It includes the standard edition plus a distribution kit for creating royalty-free runtime applications, a connectivity kit for building applications that access other databases via Microsoft's Open Database Connectivity specification and a workgroup kit for mail-enabling applications.

FoxPro 2.6 Professional will cost $767 for new users and $510 for users upgrading from earlier versions or from the standard edition.

Cunningham is IDG News Service's Paris correspondent.

IF YOU'RE IN SONOMA, CALIFORNIA, THERE ARE 65 PEOPLE WHO CAN HELP YOU BUILD AN INFORMATION SYSTEM WITH WINDOWS NT.™

DataMost Corp. has introduced StatMost, a statistical analysis and scientific graphics software.

According to the Salt Lake City company, the product uses a graphical user interface in a DOS environment with most of the standard Windows interface power: multiple document windows, drop-down menus, status bar and on-line help system and mouse support.

StatMost offers a data sheet that performs advanced data management, complete statistical analysis, numerical computation and time-series analysis.

The product requires an IBM PC, XT, PS/2 or AT-compatible computer.

StatMost is available at an introductory price of $149 until Sept. 1.

▶ *DataMost*
(801) 484-3860

TouchStone Software Corp. has introduced Setup Advisor, a mini-utility that advises users on the installation and set-up of hardware add-ons.

According to the Huntington Beach, Calif., company, the product can collect detailed system configuration data and make hardware setup recommendations for PC upgrades, including CD-ROMs, faxes, sound cards, modems and other equipment.

Setup Advisor also features Helping Hand, a set of steps designed for inexperienced users who need to collect information, select a new device and analyze setup requirements.

Setup Advisor costs $29.95.

▶ *TouchStone Software*
(714) 969-7746

Palm Computing, Inc. has introduced PalmUtilities, an assortment of utility products designed to improve the efficiency and performance of Zoomer personal digital assistants from AST Research, Inc.

According to the Los Altos, Calif., company, PalmUtilities frees up internal storage and lets users convert text files from a PC to the Zoomer.

The product includes a tune-up feature that cleans out unnecessary system files; a backup feature to safeguard data; and a small floating clock alarm that shows the current time.

PalmUtilities is available for $29.95

▶ *Palm Computing*
(415) 949-9560

Expert Software, Inc. has introduced Expert Forms for Windows, a forms design program that allows users to create and design forms.

According to the Coral Gables, Fla., company, the product comes equipped with line and box tools that include 14 line styles, 256 colors and 20 fill patterns.

Expert Forms for Wiodows costs $14.95.

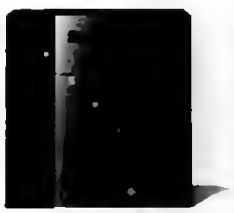
▶ *Expert Software*
(305) 567-9990

Product shorts

Nokia Display Products, Inc. has introduced the Multigraph 447X, a 17-in. color monitor. The product delivers a resolution of 1,280 pixels by 1,024 pixels at a 75Hz refresh rate and provides a resolution of 1,600 pixels by 1,200 pixels at a 60Hz refresh rate. Cost: $1,250. Nokia Display Products, Sausalito, Calif. (415) 331-6622.... **Recognita Corporation of America** has introduced RollandRead Personal, a handheld scanner. The product is a true gray-scale scanner that displays images in up to 256 shades of gray with selectable 100 to 400 dot/in. mode. A 6-ft. cable is included. Cost: $195. Recognita, Sunnyvale, Calif. (408) 241-5772.... **CheckMark Software, Inc.** has announced CheckMark Payroll for Windows, a stand-alone payroll program. Users can calculate and print checks for employer expenses, enter employee hours in a spreadsheet-style window, update tax tables manually or use CheckMark's tax update service. Cost: $129. CheckMark Software, Fort Collins, Colo. (303) 225-0522.... **Ray Dream, Inc.** has introduced AddDepth for Windows, a graphics application that allows business users with Windows to add the impact of three-dimensional graphics to reports, newsletters, presentations and marketing materials. Features include the ability to import and export to all leading Windows graphics applications. Cost: $149. Ray Dream, Mountain View, Calif. (415) 960-0768.

SUNNET MANAGER IS THE LEADING INNOVATOR, LEADING SELLER AND LEADING VISIONARY IN NETWORK MANAGEMENT. THINK WE'RE LEADING UP TO SOMETHING?

Going with the market leader is always a good idea. Especially if the market leader invented the technology. Like SunNet Manager. Integrated network tools for trouble ticketing, accounting, performance services–for all kinds of environments. So effective, over 13,000 installed customers have chosen it. Supported by Cooperative Consoles and Project ENCOMPASS, and a full suite of connectivity products, SunNet Manager is the only logical management solution for a growing network. For a free brochure on the future of network management, call 1-800-241-CONX, Dept. CD.



SunConnect

SUNNET MANAGER. RUNS YOUR NETWORK THE WAY YOUR BUSINESS RUNS.

©1994 Sun Microsystems, Inc. Sun, Sun Microsystems, the Sun Logo, SunConnect, the SunConnect logo, Cooperative Consoles and SunNet Manager are trademarks or registered trademarks of Sun Microsystems, Inc.

MICROSOFT CERTIFIED PROFESSIONALS. EXPERT ADVICE. FACE-TO-FACE. IN A LOCATION NEAR YOU.

Who says it's hard to find good help these days?

With Microsoft® Certified Professionals you're tapped into a global network of software experts. An elite corps of people who have passed our rigorous certification exams. Proving they have the skills to help you design, implement and support solutions using Microsoft products.

Microsoft Certified Professionals are uniquely qualified to design, implement and support solutions using Microsoft products.

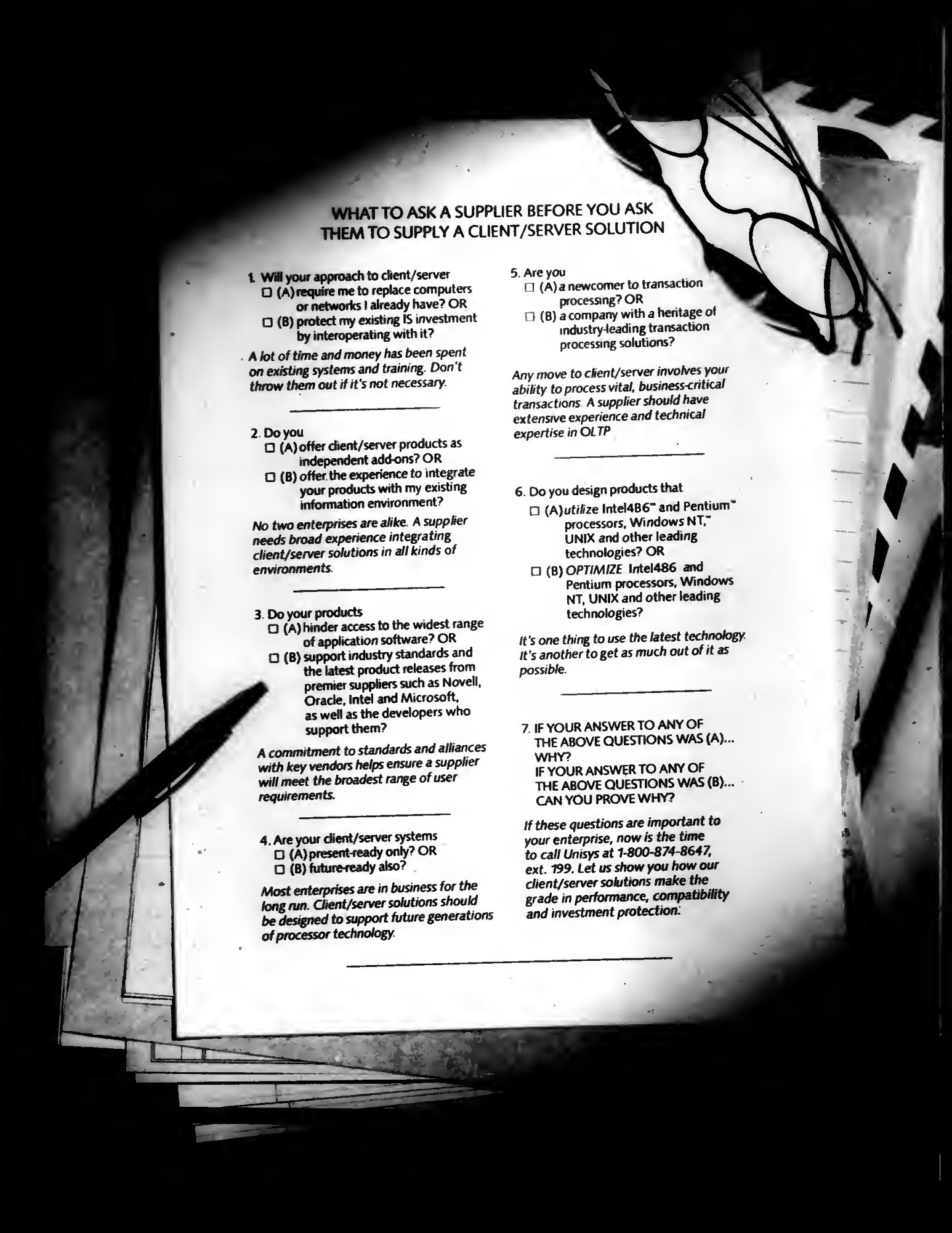
Microsoft Certified Systems Engineers can implement solutions with the Microsoft Windows NT™ operating system and other Microsoft advanced systems and workgroup products. Let's say you're the MIS Manager of an international manufacturing company. You could hire Microsoft Certified Systems Engineers to set up and support a worldwide network connecting all your employees.

Microsoft Certified Product Specialists are adept at supporting Microsoft desktop products. So your Houston design firm could hire one to install and customize the Microsoft Windows™ operating system. Or to make your entire staff more productive with Microsoft Office.

Whether you're outsourcing computer services or building your own technical organization, good help is easy to find. Just look for the Microsoft Certified Professional credential. To find out more, call (800) 426-9400 and request our Certified Professional Backgrounder.

Microsoft®
CERTIFIED PROFESSIONAL

© 1994 Microsoft Corporation. All rights reserved. In the 50 United States, call (800) 426-9400; customers in Canada, call (800) 563-9048; outside the 50 United States and Canada, call your local Microsoft subsidiary or (206) 936-8661. Microsoft is a registered trademark and Windows and Windows NT are trademarks of Microsoft Corporation.



WHAT TO ASK A SUPPLIER BEFORE YOU ASK THEM TO SUPPLY A CLIENT/SERVER SOLUTION

1. Will your approach to client/server
   - ☐ (A) require me to replace computers or networks I already have? OR
   - ☐ (B) protect my existing IS investment by interoperating with it?

A lot of time and money has been spent on existing systems and training. Don't throw them out if it's not necessary.

---

2. Do you
   - ☐ (A) offer client/server products as independent add-ons? OR
   - ☐ (B) offer the experience to integrate your products with my existing information environment?

No two enterprises are alike. A supplier needs broad experience integrating client/server solutions in all kinds of environments.

---

3. Do your products
   - ☐ (A) hinder access to the widest range of application software? OR
   - ☐ (B) support industry standards and the latest product releases from premier suppliers such as Novell, Oracle, Intel and Microsoft, as well as the developers who support them?

A commitment to standards and alliances with key vendors helps ensure a supplier will meet the broadest range of user requirements.

---

4. Are your client/server systems
   - ☐ (A) present-ready only? OR
   - ☐ (B) future-ready also?

Most enterprises are in business for the long run. Client/server solutions should be designed to support future generations of processor technology.

---

5. Are you
   - ☐ (A) a newcomer to transaction processing? OR
   - ☐ (B) a company with a heritage of industry-leading transaction processing solutions?

Any move to client/server involves your ability to process vital, business-critical transactions. A supplier should have extensive experience and technical expertise in OLTP.

---

6. Do you design products that
   - ☐ (A) *utilize* Intel486™ and Pentium™ processors, Windows NT,™ UNIX and other leading technologies? OR
   - ☐ (B) *OPTIMIZE* Intel486 and Pentium processors, Windows NT, UNIX and other leading technologies?

It's one thing to use the latest technology. It's another to get as much out of it as possible.

---

7. IF YOUR ANSWER TO ANY OF THE ABOVE QUESTIONS WAS (A)... WHY?
   IF YOUR ANSWER TO ANY OF THE ABOVE QUESTIONS WAS (B)... CAN YOU PROVE WHY?

If these questions are important to your enterprise, now is the time to call Unisys at 1-800-874-8647, ext. 199. Let us show you how our client/server solutions make the grade in performance, compatibility and investment protection.

Why buy someone's client/server vision if they can't see what you already have?

Put any vendor to the test. See if they build on your existing solutions – or just replace them.

If you've been examining client/server suppliers you may have noticed that many don't see the value of your current systems. Some want you to replace your products with theirs because that's all they're comfortable with. Some don't have the integration and open networking experience to make your different systems work together. And some just don't understand that client/server works best by improving on what you have and integrating it with what you need.

Things are different at Unisys. Our client/server solutions are designed from the start to work with the systems you're using today. And thanks to our long-term partnerships with companies like Intel, Microsoft, Oracle and Novell, you can be sure we'll keep you in the mainstream of client/server development and give you access to a wealth of hardworking applications.

Client/server involves the total enterprise: desktop systems, mid-range servers, enterprise servers and the networks that hold them together. At Unisys, we can deliver and integrate it all today.

So use this short test to see how client/server suppliers measure up on some important issues. Then call Unisys at 1-800-874-8647, ext. 199, and learn more about a client/server vision that has its eyes wide open.

UNISYS

We make it happen.

© 1994 Unisys Corporation. The Intel Inside Logo, Intel486 and Pentium are trademarks of Intel Corp. All brands and product names are acknowledged to be trademarks of their respective holders.

ONCE AGAIN, WE'VE GOT IT. AND THEY STILL DON'T GET IT.

We've got it: IPL's ESP design features customer-replaceable HDAs and power supplies. For quick upgrade and integration of future technologies. And easy service while your AS/400 remains available. Backed by the industry's only three-year warranty.

The Big Guy's Latest Still Can't Beat IPL's ESP 7000 Series. And They're Miles From Matching Our New 2 Gig Model.

We've been shipping it for months. Now the other guys think they've got it. We say bull. They can't match the capacity, functions or options of IPL's existing ESP 7000 Series – or our new 2 gig solution.

IPL's ESP 7000 Series delivers up to 50% more performance, now. And our modular ESP platform includes customer-replaceable HDAs and power supplies, for easy service and integration of future technologies:

MODEL 40s	9337-040	9337-140	9337-240
Front Panel Selectability	No	No	Yes
RAID 5	No	Yes	Yes
Mirrored Write Cache	No	No	Yes
Dynamic Read Cache	No	No	No
Customer Replaceable	No	No	No
	N/A	Standard	25% FASTER

IPL also takes you to 200 performance, and beyond. We'll plug into 6501 technology and upgrade all Model 20s to Model 40s – something they simply can't do:

MODEL 20s	9337-020	9337-120	9337-225
Front Panel Selectability	No	No	Yes
RAID 5	No	Yes	Yes
Mirrored Write Cache	No	No	Yes
Dynamic Read Cache	No	No	No
Customer Replaceable	No	No	No
	N/A	Standard	25% FASTER

*IPL's ESP 7000 Series combines the latest technology with the greatest performance, affordability and reliability in the AS/400 marketplace. And IPL's ServiceOne Direct service uses remote diagnostics to identify problems and notify IPL ServiceOne – without customer intervention. So get it all, now. Just call your IPL Representative or Storage Authorized Reseller (**Star**). And get storage designed for your future. Designed for keeps. Or test IPL's ESP 7000 Series performance against any equipment you're currently using, call*

STAR ipl STORAGE AUTHORIZED RESELLERS

1-800-475-3678

ipl FOR KEEPS. SYSTEMS

124 Acton Street • Maynard, Massachusetts 01754
In Massachusetts: 508-461-1000

Other product names are registered trademarks of their respective companies © 1994 IPL

Richard Finkelstein

Taking the lion's share

The Microsoft/Sybase divorce is more than a simple parting of ways. It is a schism that divides the client/server war into two camps.

On one side are the Unix vendors that believe customers want operating system independence and are willing to pay the price for it. On the other side is Microsoft, which wants to dislodge Novell's NetWare and Unix from server platforms by integrating a highly efficient set of products and services into its scalable Windows NT operating system. It's one size fits all vs. one stop buys all.

Microsoft is using Windows NT and SQL Server to extend Windows from the desktop into enterprisewide applications. By controlling the desktop and the server, Microsoft can control the direction of the industry. It is using its dominance of the desktop to deliver a suite of products that other vendors find very difficult to match. Microsoft can use its control of NT to gain the same advantage on the server. If it is successful, the other vendors can only grumble and follow.

The buck stops here

Microsoft's advantage over Unix and NetWare software competitors is that it does not expend a large amount of resources trying to support a myriad of different Unix and NetWare operating systems. By focusing its efforts on building and supporting a single operating system, Microsoft can optimize its products for NT and still have scalability on Intel, RISC and Alpha platforms.

Microsoft can design, test and support its Windows and NT products as a single cohesive unit. Single-vendor support is in many ways preferable to multivendor environments, which are plagued by problems that cannot be resolved and vendors that spend their time pointing the finger at other vendors. At least with a single supplier only one vendor is responsible for resolving problems. Whether or not the vendor fixes the problem is another question.

The plan is to use SQL Server NT as the basis for integrated mail services, enterprisewide administration tools and distributed database management. When and if these products become available, Microsoft will deliver them with a vengeance. Microsoft lists an unlimited-user version of SQL Server NT at $15,000 but offers it to its large customers for $2,500. One can understand how uncomfortable Sybase and Oracle must feel, especially when one considers that SQL Server NT performs as well as Unix

Finkelstein, *page 58*

Vendors expand object products

Upgrades aim to stir slow market

By Kim S. Nash

Hoping to turn up the volume on what has been a relatively quiet market, two of the larger object-oriented database makers recently announced and/or shipped enhanced versions of their products.

Ontos, Inc. in Burlington, Mass., last week announced Ontos/DB 3.0, an upgrade to its object database management system that includes data storage features designed to access information stored in non-object sources.

Meanwhile, Menlo Park, Calif.-based Versant Object Technology Corp. is expected to ship next week an upgrade to Versant ODBMS, which can store and manipulate objects generated from a variety of C++ compilers. Most object databases can handle only material produced by a single C++ compiler.

Because the object database market is still comparatively young, vendors are able to differentiate products by adding specific capabilities. But as offerings mature, they will start to look more homogeneous, observers said.

More features are "always good for [users]," said Jason Browning, a member of the technology staff at AT&T Bell Laboratories, which has been an Ontos user since October 1991. "Down the road, though, the various object companies will start to fight it out on price and speed," he said.

A world apart

Network management is an increasingly popular application for object databases. MCI Communications Corp. and Fujitsu Ltd., for example, contend that object-oriented technology makes sense for monitoring network activity because such applications are best handled with graphics rather than with relational or flat-file data.

In beta testing since January at Fujitsu, Texas Instruments, Inc. and a handful of other sites, Versant ODBMS Release 3.0 claims several key enhancements, the following of which are borrowed from the relational world:

- The ability to create and manage objects across distributed PC and Unix operating systems.
- Performance improvements of 20% and 100%, created by tweaking internal algorithms, speeding up two-phase commit routines and cutting transaction log overhead.
- Ability to do on-line, incremental backups of, for example, database changes since the last full backup.

Users will have to convert existing applications to access new functions in Release 3.0, said Dave Kellogg, Versant's director of marketing.

A migration utility will be included with the upgrade, which is scheduled to ship this week for Sun Microsystems, Inc. SPARCservers. Versions for Unix boxes from IBM, Hewlett-Packard Co. and Silicon Graphics, Inc., as well as PCs running IBM's OS/2 and Next Computer, Inc.'s NextStep, are due later this quarter.

On the way

Versant databases for Microsoft Corp. Windows 3.1 and Windows NT platforms are currently in beta testing, but officials did not specify a ship date. For its part, Ontos plans to ship an NT port of its database by late this year, motivated by a large contract with a San Francisco-area utility.

A three-way deal of Pacific Gas & Electric Co. (PG&E), Ontos and Microsoft calls for codevelopment of customer-service, billing, network management and other applications for an unspecified number of years, according to John Danielson, vice president of computer and telecommunications services at PG&E.

The utility's network expansion calls for Ontos/DB 3.0, which includes the following features:

- A storage management kit designed to let users access non-object data sources.
- Versioning and configuration management tools to let developers better track ongoing projects.
- On-line schema generation by which developers can model potential database structures on-line.

Notes provides image of the future

By Ellis Booker

● To bring electronic document imaging to the widest possible audience and drop it onto almost every desktop, two things must happen. Large and small imaging systems must interact seamlessly with corporate infrastructures, such as electronic mail and Lotus Development Corp.'s Notes, and the systems need to become much easier and more intuitive to use and configure.

Strides in both areas were seen at the Association for Information and Image Management (AIIM) show and conference held recently in New York.

On the infrastructure front, this year's AIIM show was notable for the broad support of Notes. (Lotus, at AIIM for the first time this year, set up shop in a relatively modest booth, belying the importance of its groupware product to the other show vendors.)

"Yes, it's definitely become a checklist item for customers," acknowledged one well-known imaging vendor that has yet to announce a schedule for Notes support.

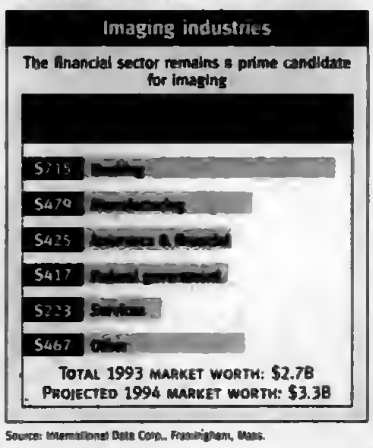
At the show, vendors used Notes to ship images to casual users from production-oriented imaging systems or as a vehicle for adding unstructured data to an imaging application.

On the ease-of-use front, the show proved that a graphical user interface is more than a pretty way to work.

At the crowded Watermark Software, Inc. booth, for instance, the company demonstrated the industry's first imaging product that is compliant with Microsoft Corp.'s Object Linking and Embedding (OLE) 2.0.

Shipping now, the Watermark Professional Edition ($60 to $300 per seat) offers image enabling by which objects are placed, either manually or via OLE automation, into documents created by other OLE 2.0-compliant applications.

Imaging, *page 64*



Source: International Data Corp., Framingham, Mass.

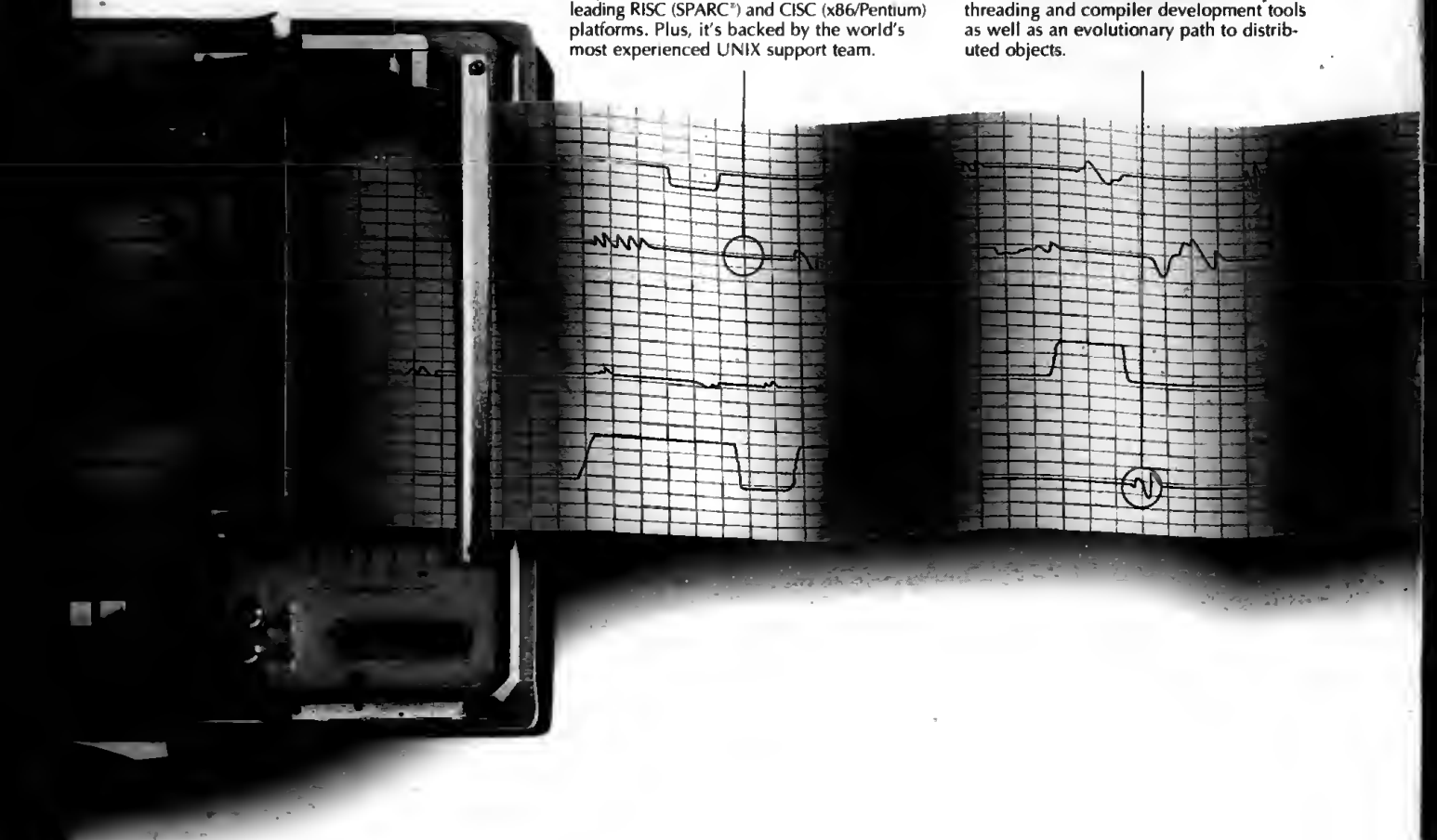
THE TRUTH
SOLARIS SOFTWARE

SOLARIS IS THE #1 UNIX ENVIRONMENT.

True. Solaris® has more licensed users (1,500,000+), runs more 32-bit applications (8,600+), and is installed on more multiprocessing servers† than any other UNIX® environment. In fact, Solaris has about 50% of the UNIX software development market and is the only software environment that runs on the leading RISC (SPARC®) and CISC (x86/Pentium) platforms. Plus, it's backed by the world's most experienced UNIX support team.

SOLARIS HAS THE MOST ADVANCED TECHNOLOGY.

Positively. Solaris supports from 2- to 32-way multithreaded symmetrical multiprocessing, networked multimedia and thousands of clients over global WANs. It provides proven centralized system administration, network management and security for mission-critical software. Not to mention advanced multithreading and compiler development tools as well as an evolutionary path to distributed objects.



ABOUT THE ENVIRONMENT.

SOLARIS INTEGRATES THE ENTIRE ENTERPRISE.

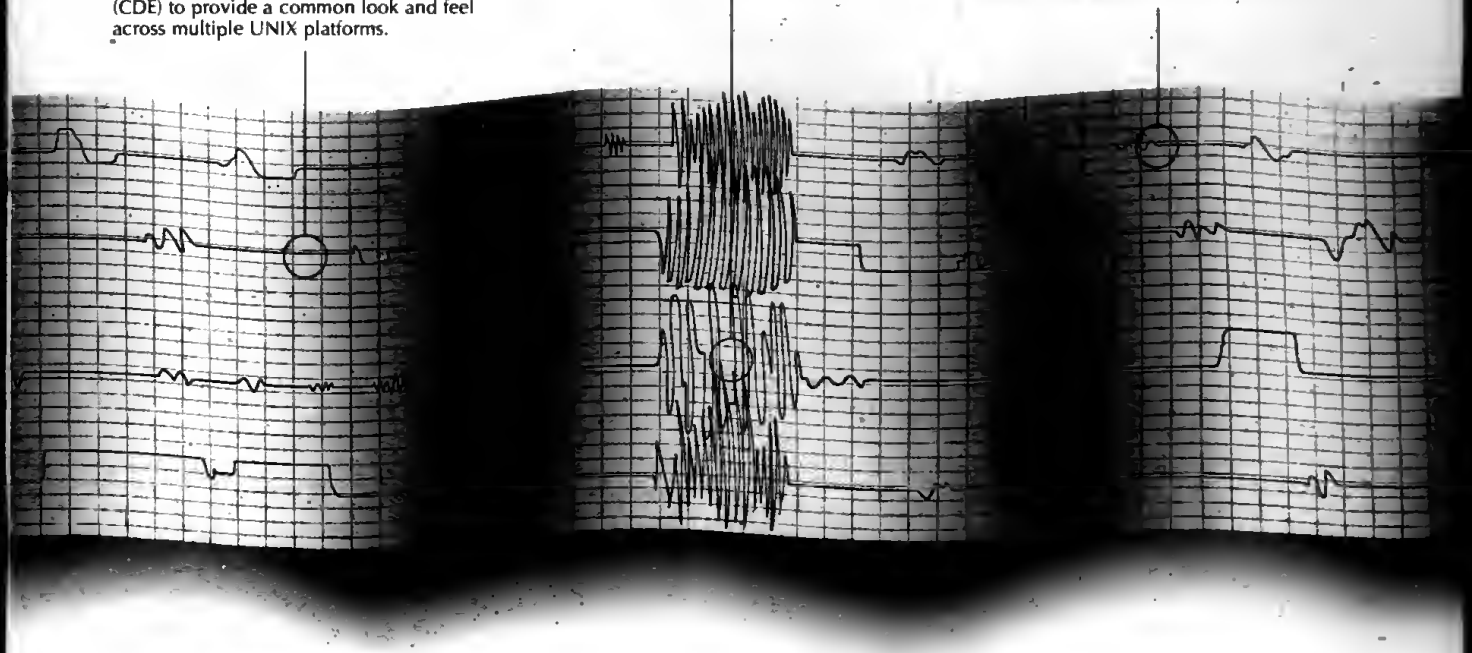
Absolutely. Solaris offers the leading implementation for enterprise TCP/IP (ONC+™/NFS®). And it provides DCE and IBM connectivity, links LANs via NetWare IPX/SPX, and is Internet fluent. It also integrates Windows, DOS and Macintosh programs into a 32-bit environment.* What's more, SunSoft™ is pioneering the Common Desktop Environment (CDE) to provide a common look and feel across multiple UNIX platforms.

CAN NT RUN YOUR ENTERPRISE THIS WELL?

Yeah, right. NT can also run the Boston Marathon, the Kentucky Derby and the rest of your life.

SOLARIS TURBOCHARGES PCs.

Definitely. Solaris x86 delivers 32-bit functionality to the x86/Pentium platform (and PowerPC next year). So now you can have easy access to virtually all local and remote data from your favorite PC — like IBM, Compaq, Dell, AST and Zenith — as well as the latest Pentium-based desktops and multiprocessing servers.



With all the hype you're hearing about 32-bit environments, we'd like to offer you a refreshing alternative: The truth. Hundreds of Global 2,000 companies like American Airlines, British Petroleum, Citibank N.A., Sprint, Ciba-Geigy and the Boston Stock Exchange are solving many of their complex commercial rightsizing problems today with Solaris, the premier 32-bit network-based software environment. And that's no lie.

CALL US ON IT: 1-800-SUNSOFT or surf the Internet with Mosaic at http://www.sun.com/

SunSoft

© 1994 Sun Microsystems, Inc. SunSoft, the SunSoft Logo, Solaris, ONC+ and NFS are trademarks or registered trademarks of Sun Microsystems, Inc. SPARC is a registered trademark of SPARC International, Inc. UNIX is a registered trademark of UNIX System Laboratories, Inc., a wholly owned subsidiary of Novell, Inc. All other trademarks or registered trademarks are the property of their respective companies. *SPARC applications. †InfoCorp/R.M. Fichera Assoc. 6/93. ‡Third-party software may be required.

Notes provides image of the future

CONTINUED FROM PAGE 51

Unlike OLE 1.0, these embedded objects can be edited from within the object's new home — a word processing document or a spreadsheet.

Meanwhile, Viewstar Corp. in Emeryville, Calif., showed its recently announced Process Architect system for designing workflow paths. Process Architect uses drag-and-drop icons, preconfigured objects for various tasks and even application templates for different industries. The product is expected to ship by the end of the year.

Thomas E. Carroll, project director for imaging systems at the Washington State Department of Labor and Industries in Olympia, agreed that pervasive, enterprisewide imaging is "generally where things are going."

"But," he added, "a lot of what the advanced technologies people are talking about aren't being implemented here yet."

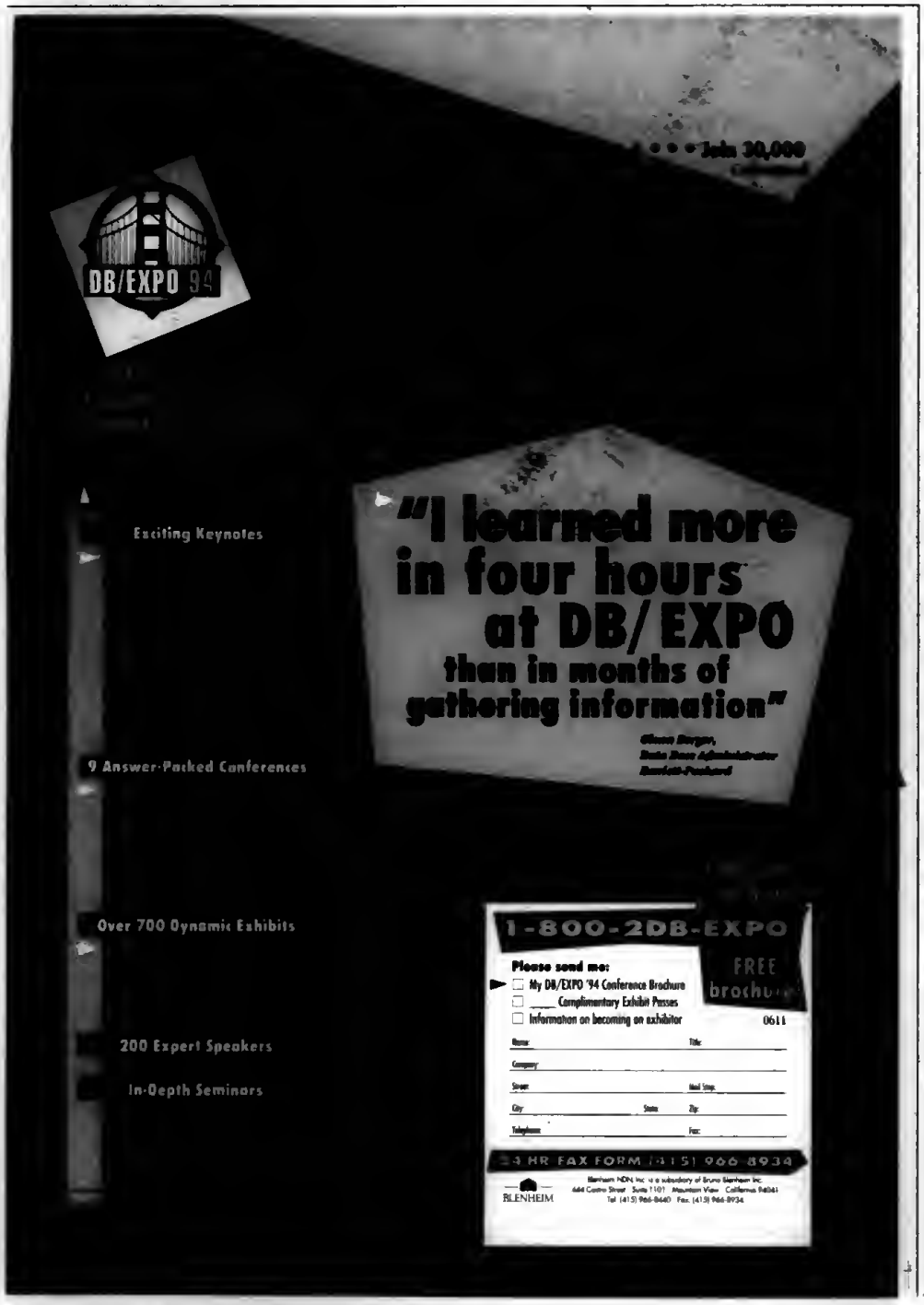
Quantum leap

The state agency, which won an award for excellence in imaging at AIIM from BIS Strategic Decisions in Norwell, Mass., is completing an $18 million, 500-seat imaging system for the Washington State Fund. The fund furnishes worker's compensation insurance for 120,000 employers and 1.3 million workers.

The system, which uses Hewlett-Packard Co. HP 9000 processors to run the Plexus XDP imaging system from Recognition International, Inc., is expected to reduce the time it takes to route documents to agents from two to three weeks to a single day.

Other products and announcements at the AIIM show included the following:

- **HP** introduced a 20G-byte, "introductory" optical jukebox for $6,995. The unit is upwardly compatible with HP's top-of-the-line 188G-byte system. The market leader in the jukebox business, HP also announced a software management system that allows a user to configure a jukebox into a single logical drive.
- **IBM** said its ImagePlus VisualInfo document management platform, introduced in February, would be generally available in 60 days. To muster third-party interest, IBM sold a $49, CD-ROM-based demonstration developer's kit for the product.
- **Lotus** said a point release of Notes would include an on-line workflow guide, as well as workflow databases.
- **Adobe Systems, Inc.** offered a technology demo of what it called "Acrobat Page Recognition Software." The system uses optical character recognition to translate a bit-mapped page image into an Acrobat file format while retaining the original document's formatting and font information items typically lost when an image is processed through optical character recognition software.
- **SHL Systemhouse, Inc.** demonstrated SHLConnect, a product that uses the Keyfile Corp. Document Server as a front end to IBM's host-based (OS/2 or MVS/ESA) VisualInfo Library and Object Servers. SHLConnect allows VisualInfo to support a mix of VisualInfo clients for OS/2 and Keyfile clients for Windows.
- **Impower**, a Salt Lake City, start-up founded by a group of former Novell, Inc. employees, announced the first scanning and imaging application loadable modules (ALM) created with Novell's AppWare software. Called ImagePower Scan/View, the general-purpose software is priced at $349 per seat. Impower's ALMs are based on the ViewDirector from TMS, Inc. in Stillwater, Okla.



Brief

Novell LANalyzes

Novell, Inc. recently announced its LANalyzer for Windows 2.1, which it said is the first Windows-based network analysis tool that supports NetWare, UnixWare, Macintosh, Unix and IBM networks. The $1,495 portable LAN analysis tool supports 100M bit/sec. Ethernet technologies and networks using Network File System and SNA, Novell said.

Fill it out. Fax it in. Save $8.

FAX NO. 508-626-2705

Yes, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $39.95* per year - a savings of $8.00 off the basic subscription price.

First Name MI Last Name

Title Company

Address City State Zip

Address Shown ❑ Home ❑ Business ❑ New ❑ Renew Basic Rate $48 per year

* U.S. Only. Canada $95. Mexico, Central/South America $150. Europe $295, all other countries $295. Foreign orders must be prepaid in U.S. dollars

Please complete the questions below to qualify for this special rate.

1. BUSINESS/INDUSTRY (Circle one)

10 Manufacturer (other than computer)
20 Finance/Insurance/Real Estate
30 Medical/Law/Education
40 Wholesale/Retail/Trade
50 Business Service (except DP)
60 Government - State/Federal/Local
65 Communications Systems/Public Utilities/ Transportation
70 Mining/Construction/Petroleum/Refining/Agric.
80 Manufacturer of Computers, Computer-Related Systems or Peripherals
85 Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90 Computer/Peripheral Dealer/Dist./ Retailer
95 Other_____ (Please Specify)

2. TITLE/FUNCTION (Circle one)

IS/MIS/DP MANAGEMENT
19 Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21 Dir./Mgr. MIS Services, Information Center
22 Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr./PC Mgr., Tech Planning, Admin Svs.
23 Dir./Mgr. Sys. Development, Sys. Architecture
31 Programming Management, Software Developers
41 Engineering, Scientific, R&D, Tech. Mgt.
60 Sys. Integrators/VARs/Consulting Mgt.

CORPORATE MANAGEMENT
11 President, Owner/Partner, General Mgr.
12 Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
51 Sales & Mktg. Management
70 Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT
80 Educator, Journalists, Librarians, Students
90 Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep
App. Development Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No

COMPUTERWORLD

E4418-3

Recyclable Paper

Fill it out. Fax it in. Save $8.

FAX NO. 508-626-2705

Yes, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $39.95* per year - a savings of $8.00 off the basic subscription price.

First Name MI Last Name

Title Company

Address City State Zip

Address Shown. ❑ Home ❑ Business ❑ New ❑ Renew Basic Rate $48 per year

* U.S. Only. Canada $95. Mexico, Central/South America $150. Europe $295, all other countries $295. Foreign orders must be prepaid in U.S. dollars

Please complete the questions below to qualify for this special rate.

1. BUSINESS/INDUSTRY (Circle one)

10 Manufacturer (other than computer)
20 Finance/Insurance/Real Estate
30 Medical/Law/Education
40 Wholesale/Retail/Trade
50 Business Service (except DP)
60 Government - State/Federal/Local
65 Communications Systems/Public Utilities/ Transportation
70 Mining/Construction/Petroleum/Refining/Agric.
80 Manufacturer of Computers, Computer-Related Systems or Peripherals
85 Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90 Computer/Peripheral Dealer/Dist./ Retailer
95 Other_____ (Please Specify)

2. TITLE/FUNCTION (Circle one)

IS/MIS/DP MANAGEMENT
19 Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21 Dir./Mgr. MIS Services, Information Center
22 Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr./PC Mgr., Tech Planning, Admin Svs.
23 Dir./Mgr. Sys. Development, Sys. Architecture
31 Programming Management, Software Developers
41 Engineering, Scientific, R&D, Tech. Mgt.
60 Sys. Integrators/VARs/Consulting Mgt.

CORPORATE MANAGEMENT
11 President, Owner/Partner, General Mgr.
12 Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
51 Sales & Mktg. Management
70 Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT
80 Educator, Journalists, Librarians, Students
90 Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep
App. Development Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No

COMPUTERWORLD

E4418-3

Recyclable Paper

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD
P O BOX 2044
MARION OHIO 43306-2144

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD
P O BOX 2044
MARION OHIO 43306-2144

CHECK US OUT!

We've Got Solutions for You... Every Week.

Computer Products

- ✔ Access Flooring
- ✔ Application Development Tools
- ✔ Bus Accelerators
- ✔ Carrying Cases
- ✔ Computers
- ✔ Computer Training Products
- ✔ Connectivity Software
- ✔ Co-processors
- ✔ Data Communications
- ✔ Desktop Systems
- ✔ Disk Drives
- ✔ Environmental Systems/ Computer Rooms
- ✔ Frequency Converters
- ✔ Help Desk Systems
- ✔ Internetworking Applications
- ✔ Keyboards
- ✔ Laptops
- ✔ Memory Boards
- ✔ Memory Options
- ✔ Mobile Disk Drives
- ✔ Monitors
- ✔ Network Management Software
- ✔ Notebooks
- ✔ Optical Disks
- ✔ OS/2 Storage
- ✔ PCs
- ✔ Peripherals
- ✔ Portables
- ✔ Printers
- ✔ Processors
- ✔ Projection Panels
- ✔ Projectors
- ✔ RAID Disk Systems
- ✔ Security Devices
- ✔ Stackable Storage
- ✔ Standby Generators
- ✔ Tape Back-up Drives
- ✔ Terminals
- ✔ Uninterruptible Power Systems
- ✔ Upgrades
- ✔ Windows Applications
- ✔ Workstations

Computer Services

- ✔ Association Membership
- ✔ Equipment Deinstallation/Removal
- ✔ Equipment Purchasing
- ✔ Leasing
- ✔ Maintenance
- ✔ New and Used Sales
- ✔ Online Service
- ✔ Outsourcing
- ✔ Parts/Service
- ✔ Programming
- ✔ Remote Computing
- ✔ Rental
- ✔ System Integration
- ✔ Technical Support
- ✔ Timesharing
- ✔ Trading
- ✔ Training

COMPUTERWORLD

Marketplace

Product and Service Solutions Worth Checking Out!

Turn to Page 121

Now that Lotus N
work this well togethe

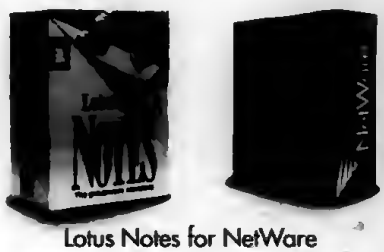
otes and NetWare

r, your group can, too.

Every decision your group makes can now be far more informed, much wiser and occur with a speed never before possible.

Because now the world's most powerful workgroup productivity tool fits seamlessly onto the world's most powerful network. Together, they place you at the center of a whole new class of applications that radically improve strategic business processes–like customer service, account management and product development.

Now you can access, organize and share in minutes information that once took weeks to disseminate. Group members–even if they're widely scattered or only occasionally connected to the network–can make better decisions faster, to make your company more competitive.



Lotus Notes for NetWare

As a NetWare® Loadable Module™, Lotus Notes® integrates immediately into your familiar NetWare environment, making it even more powerful. It's yet another way NetWare acts as a true "plug and play" platform for building advanced applications and services on your information system–right now (without starting from scratch), and well into the 21st century.

Call 1-800-554-4446 for a free demo disk detailing how NetWare and Notes can help any group work faster and smarter, in harmony.

Lotus
Working Together

NOVELL.
The Past, Present, and Future of Network Computing.

Finkelstein

CONTINUED FROM PAGE 51

RDBMSs but costs 10 to 20 times more. Because SQL Server NT can be run on RISC and Alpha boxes, Oracle and Sybase will find it difficult to keep their current pricing structure and still be competitive.

Unix RDBMS vendors such as Sybase, Informix and especially Oracle are caught in a bind. By pursuing a one-size-fits-all strategy that addresses widely dissimilar and diverging operating system platforms, the Unix RDBMS vendors constantly face the engineering nightmare. This forces RDBMS vendors into design compromises that affect the performance and stability of their products. It also makes it very difficult to support and maintain software because operating systems are constantly changing and there are so many versions. Rather than get involved with these chronic problems, Microsoft has chosen to do an end around and put all its efforts into its single scalable NT operating system.

While Microsoft is speeding along, Unix vendors are frittering away their time arguing about nonexistent standards and toothless standards committees. For those who believe that customers will revolt against Microsoft's "proprietary" strategy and vote for "open" Unix, I would point out that customers do indeed purchase proprietary operating systems in droves.

The only company that can challenge the Microsoft juggernaut is IBM. IBM has its own set of desktop and server operating systems, which are technically competitive but are dying in the marketplace. IBM is not going anywhere until OS/2 can challenge Windows on the desktop, and OS/2 doesn't have a prayer as long as it depends on OS2/Windows for its application support. One would think that by this time IBM would have figured this out, but it still doesn't get it. Well, maybe it's time for IBM to pass the baton over to Microsoft as the new king of the hill. Or maybe it's time for IBM to wake up and do battle.

Finkelstein is president of Performance Computing, Inc., a Chicago consultancy specializing in client/server technology. He can be reached by CompuServe at 72240,2536.

IF YOU ONLY ATTEND ONE DATABASE EVENT IN 1994
THIS IS THE ONE!

DATABASE & CLIENT/SERVER WORLD
JOINED BY
RM25: THE RELATIONAL DBMS SILVER ANNIVERSARY CONFERENCE
JUNE 28-30, 1994 • BOSTON, MA

DCI's DATABASE & CLIENT/SERVER WORLD was the first and is now the largest conference and exposition dedicated to database oriented technologies and solutions and client/server computing. More people in 1993 attended this show than any other comparable event. With the exciting addition of RM 25, running concurrent with DATABASE & CLIENT/SERVER WORLD, this is one database event you simply can't afford to miss!

HIGHLIGHTS OF DATABASE & CLIENT/SERVER WORLD
DATABASE & CLIENT/SERVER WORLD, consists of eleven separate conferences focusing on the latest technologies, including the Notes Conference, sponsored by Lotus Development Corporation. The Expo showcase, with over 700 exhibits, allows you to preview new products and services rapidly emerging for professionals who must deal with database and client/server issues.

HIGHLIGHTS OF RM 25:
RM 25: The Relational DBMS Silver Anniversary Conference is a once-in-a-lifetime technology summit featuring the exclusive 1994 U.S. public appearance of the inventor of RDBMS, Dr. E. F. Codd. This multi-track conference is designed to provide database technologists with the latest information on database areas of research, current technology and user success stories.

SPONSORED BY:
DCI

OVER 200 INDUSTRY EXPERTS

Chris Date	Dr. W. Frank King
Richard Finkelstein	Philippe Kahn
Jeffrey B. Tash	Dr. Robert Epstein
Don Haderle	Thomas Nies
William Zachmann	Dr. Phillip Neches
Ronald G. Ross	Umang Gupta
Larry R. DeBoever	Dr. Bing Yao

GLIMPSE INTO THE FUTURE
If you are a professional wanting to get the best picture of where our industry is headed in hardware; database & client/server development, end-user computing, and application development technologies, then RM 25 and DATABASE & CLIENT/SERVER WORLD is the event for you!

ADDED BONUS
As part of your registration to RM 25, you will have the unique opportunity to attend over 150 additional presentations that are part of the DATABASE & CLIENT/SERVER WORLD CONFERENCE and visit the over 700 exhibits on the show floor. The conference sessions of RM 25 will be limited solely to those individuals who register for this truly historical event in order to maximize the experience for those present

CO-SPONSORS:
AT & T Global Information Solutions, Client/Server Computing, Computerworld Client/Server Journal, DBMS, Database Programming & Design, Gupta, IBM, Information Builders, Informix, Intel, JYACC, KnowledgeWare, LBMS, Lotus, Montage, Oracle, Powersoft, Trinzic, Uniface, XDB.

FOR MORE INFORMATION CALL (508) 470-3880 OR FAX (508) 470-0526.

BXAWC02

IBM aims to empower RS/6000 workstations

By Jean S. Bozman

As Apple Computer, Inc. rolled out its PowerPC-based servers last week, IBM was planning to put its PowerPC chip into more RS/6000 workstations that are expected to be announced this month, industry analysts said.

The new RS/6000s will be based on the PowerPC 601 chip, which is already running in IBM's desktop RS/6000 Model 250. IBM's move is designed to respond to new low-end workstations fielded by Hewlett-Packard Co., Sun Microsystems, Inc. and Silicon Graphics, Inc. in recent months.

However, the Model 250 — introduced in September with a 66-MHz PowerPC chip — may be replaced by a faster system based on an 80-MHz chip, several analysts said.

"They've got to use the PowerPC across the low end and be more aggressive in price/performance," said Dominic Ricchetti, director of workstation research at Dataquest, Inc. in San Jose, Calif.

Users are anticipating the PowerPC units as the first wave of more powerful RS/6000 desktops and servers.

"There is a need for that kind of processing in the [IBM] AIX world," said Roy Dodd, information systems director at The Good Guys, Inc. retail chain in Brisbane, Calif. "I've got 1,500 users, and I have to spread those across three servers." He now has the RS/6000 950, 980 and 990 servers but said he would prefer to install fewer, more powerful servers.

Bill Moran, a research analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y., said IBM is playing catch-up on low-end workstations and high-end symmetrical multiprocessing (SMP) servers.

Analysts said they expect IBM later this year to announce AIX 4.0 as an enhanced version of its Unix operating system, with support for multithreaded applications such as database applications on the SMP machines.

Show Us Your Objects

Announcing the 3rd Annual

COMPUTERWORLD
Object Application
AWARDS

Think your objects look pretty good?
Then show them off by entering the Computerworld Object Application Awards competition. The winners will be announced in a special ceremony on July 27 during the Object World show in San Francisco.

Object-oriented technology is on the cutting edge in the information technology world today and Computerworld wants to put the spotlight on your custom application.

Show us what your objects look like.
Your entry for Computerworld's 1994 Object Application Awards should be an internally developed, custom object-oriented application currently in use (not a prototype) and not for resale. It should be either an entirely new application, a modification of an off-the-shelf application, or an object-based, front-end for a host application.

Then meet Steve Jobs on July 27.
In a special awards ceremony at the Moscone Convention Center in San Francisco, Steve Jobs, Chairman and CEO of NeXT Computer Inc. will present the awards for outstanding application development using object-oriented technology. A reception, sponsored by Digital Equipment Corp. will follow.

Call today for entry.
To request your official entry kit*, call or fax:

Bill Hoffman
Computerworld Object Application Awards
c/o Object Management Group
492 Old Connecticut Path
Framingham, MA 01701
Telephone: (508) 820-4390
FAX: (508) 820-4303

Deadline for entries is Midnight (EST), May 16, 1994

We're looking for a few good objects.

Sponsored by:

COMPUTERWORLD
The Newspaper of IS

IBM

OMG
OBJECT MANAGEMENT GROUP

OBJECT WORLD

*The Computerworld Object Application Awards entry kit contains all details, rules and qualifications for this contest
Contest is void where prohibited by law. No purchase necessary
©1994 Computerworld, 375 Cochituate Road, Framingham, MA 01701-9171, Tel (508) 879-0700, Fax (508) 879-0446

COMPAQ AND MICROSOFT.
THE CONNECTION THAT'S MAKING
"PLUG AND PLAY" A REALITY.

Just about everyone who's ever used a computer has experienced the same thought: Wouldn't it be great if setting up or upgrading your machine was as easy as turning it on?

The idea is called "Plug and Play." People have been talking about it for years. But now, an ongoing partnership between Compaq and Microsoft, working with other industry leaders, is actually making it happen.

Plug and Play is the result of some very fresh thinking in both hardware and software – an accomplishment that tapped the combined engineering expertise of both companies. Together, Compaq® computers and the next version of the Microsoft® Windows™ operating system (code-named Chicago) will deliver the long-promised benefits of true Plug and Play: easy setup, easy expansion and easy connection to peripherals.

Which means no more configuration headaches. No more hidden switches, cryptic codes or mystery.

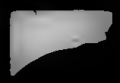
Even today, Compaq is shipping computers that will take full advantage of Plug and Play technology as soon as the forthcoming version of Windows is available. So the Compaq & Windows combination will quickly become the standard for Plug and Play computing. A welcome reassurance for people who buy computers.

COMPAQ Microsoft®

© 1994 Compaq Computer Corporation. All Rights Reserved. Compaq Registered U.S. Patent and Trademark Office. Microsoft is a registered trademark of the Microsoft Corporation. Windows is a trademark of the Microsoft Corporation.

THE LONG AND THE SHORT OF CHOOSING A ROUTER AS TOLD BY FIRST OF AMERICA.

THE SHORT OF CHOOSING A ROUTER AS TOLD BY PROTEON.



BOB FISHER

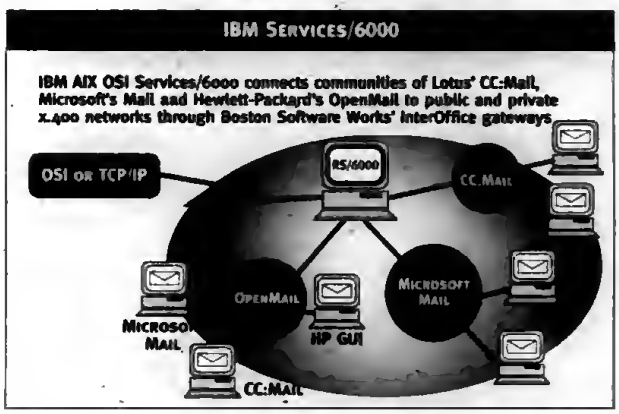
HP, IBM scramble to fill messaging void

By Lynda Radosevich

■ Large customers are looking for messaging services that are more robust than LAN vendors' current offerings, and Hewlett-Packard Co. and IBM are stepping in to fill this void with revamped X.400 services that reside on their respective Unix workstations.

Users have long complained that PC-based electronic mail is difficult to scale and integrate with other systems. That, plus explosive growth — up to 83% in two years, according a recent study — has information systems staffs looking for robust back-end messaging services. Vendors are scrambling to meet this need before Microsoft Corp.'s and Lotus Development Corp.'s rearchitected messaging servers hit the market next year.

At the Electronic Messaging Association (EMA) conference in Anaheim, Calif., last month, IBM outlined a long overdue messaging plan aimed at its customers who want a client/server messaging strategy based on the RS/6000 and open systems guidelines.



A modular plan

IBM's strategy, called the AIX OSI Services/6000, includes a Message Transfer Agent (MTA) based on the 1988 version of the X.400 standard. The MTA, operating on the RS/6000 and the AIX operating system, can natively route messages over Open Systems Interconnect (OSI) or TCP/IP networks. It also includes file transfer and communications services over local- and wide-area networks.

Kuo & Associates, a Fort Collins, Colo., systems integrator for government organizations, uses IBM's current OSI messaging and file transfer product and plans to install AIX OSI Services/6000 to comply with its customers' Government Open Systems Interconnect Profile (GOSIP) II requirements.

"Before, you had to know a lot about OSI and use special procedures for installation and support. The new version is more modular so you can buy the pieces that you need," said Kenneth Lini, a vice president at Kuo. He also said the revamped product line is "well-integrated" with IBM's systems management interface tool for the RS/6000.

A vital piece of IBM's plan is a set of gateways from Boston Software Works that will connect Lotus' CC:Mail, Microsoft's Mail and HP's OpenMail to the IBM MTA. Boston Software Works will supply the gateways by modifying its InterOffice line.

The combination should allow users of one messaging system to send objects, including text memos, revisable work processing documents or binary attachments such as spreadsheets, to users on incompatible systems. It also takes care of synchronizing directories and users' addresses.

The third leg of the strategy is an arrangement with Isocor in Los Angeles. Isocor will develop a version of its Isotrade Electronic Data Interchange server, which is based on the X.435 standard, for the IBM MTA.

IBM strategy ... finally

"Big Blue is finally showing signs of having a messaging strategy," said David Whitten, an analyst at Gartner Group, Inc. in Stamford Conn. "It should be attractive to companies on mainframes that are looking for solutions now" instead of waiting for the LAN vendors to deliver.

Currently, IBM offers to sell Lotus CC:Mail and Notes to its mainframe OfficeVision and Professional Office System customers. However, the Lotus and IBM products do not interconnect well.

Meanwhile, HP introduced at the EMA show new management capabilities including continuous access for its OpenMail system. The HP system lets end users keep their desktop clients such as Microsoft Mail, CC:Mail and, most recently, Notes. At the same time, customers can use HP's back-end Unix server with a single unified message store, X.400 message transport and X.500 directory services.

Other OpenMail updates include the following:

- Support for up to 25% more users, or roughly 3,000 per server, because of more tightly written code.
- Exchange with X.500 directories.

Messaging, *page 69*

Network management

Lannet simplifies intelligent hubs

By Stephen P. Klett Jr.

Lannet, Inc. in Irvine, Calif., recently took steps to simplify the management of networks based on its MultiNet family of intelligent hubs. The company announced virtual networking and Remote Network Monitoring (Rmon) support for its graphical network management application for Hewlett-Packard Co.'s OpenView.

Version 2.0 of Lannet's MultiMan/OV platform allows MultiNet users to create and manage virtual LANs consisting of workstations connected via Lannet's LANswitch Ethernet switching modules.

The virtual-management capabilities are provided in a separate graphical application called VirtualMaster/OV. Network administrators can use this to create virtual networks and assign users to the different logical segments by simply pointing and clicking, the company said.

Analysts said these virtual capabilities are vital because they offer users a new level of flexibility as well as potential cost savings.

"With virtual LANs you can make the network adapt to the way a company works instead of making the company adapt to the network," said Michael Howard, president of Infonetics Research, Inc. in San Jose, Calif. For example, virtual LANs can designate who is going to be in a workgroup through software instead of requiring network administrators to physically plug users into a concentrator, Howard said.

Cost reduction

The primary benefit to users lies in reducing the labor costs associated with making network adds, moves and changes, which some analysts estimate cost $300 to $400 each.

Many vendors are talking about virtual LAN capabilities, but a key differentiator in Lannet's offering is its ability to support hub-to-hub virtual networking. Most vendors' initial products have been limited to a single hub.

In addition to VirtualMaster, the following Rmon applications are also available for MultiMan/OV 2.0.

- **RmonMaster/OV:** Provides network health and alarm tools that work together to automatically perform customized baselining of network traffic and notify network administrators when threshold conditions are exceeded. Also provides tools to perform statistical analysis of traffic volume over the MultiNet hub's four Ethernet buses and LAN segments.
- **DecodeMaster/OV:** Fully decodes and displays all major LAN protocols, which enables network administrators to define their own filters to allow customized packet capture and display to troubleshoot the network. For example, traffic between two nodes could be filtered to show only IPX packets, according to Lannet.
- **InterMaster/OV:** Performs packet filtering and statistic analysis for graphically managing Lannet's integrated Ethernet and Token Ring bridge modules.

Integrated support

DecodeMaster and RmonMaster require Lannet's Integrated Ethernet Remote Probe, which is a RISC-based four-segment Rmon probe for the MultiNet hub. The $4,995 probe allows all four of the MultiNet's internal Ethernet segments to be managed simultaneously.

"The integrated Rmon support in the hub provides automation, which is another example of a network product doing something fairly routine but unique to individual networks [and] that managers no longer need to do," Howard said. Several of the hub companies, including Cabletron Systems, Inc. and Ungermann-Bass, Inc., are working to provide similar capabilities.

MultiMan/OV 2.0 will ship this month for $3,995, which includes the VirtualMaster and InterMaster applications. RmonMaster and DecodeMaster will also ship this month for $3,995 each.

Major Bulletin Board has general pull

By Gary H. Anthes

A software package for setting up on-line information services, immodestly called The Major Bulletin Board System (BBS), has attracted some 15,000 buyers ranging from the U.S. Joint Chiefs of Staff to corporate customer service groups to basement-based phone-sex operators.

The Major BBS supports electronic mail, multiuser teleconferencing, file transfers, public forum areas and file libraries with keyword searching, gateways to other commercial E-mail services and an optional module for building graphical user interfaces.

The product, from Galacticomm, Inc. in Fort Lauderdale, Fla., will support up to 256 simultaneous users on a single Intel Corp. 80386-based PC. Prices for the software range from $259 for two users to $10,000 for 256 users. Users can connect via modem, LAN, serial connection or X.25.

The company also sells a $495 GalactiBoard, which will expand a PC's four-port capacity to eight ports, and a 16-channel GalactiBox for $1,495. Multiple GalactiBoxes can be combined for still greater capacity.

A guerrilla weapon

The Major BBS fills a gap in the current networking environment, allowing employees to communicate internally as well as to customers, sales prospects and vendors, said Scott J. Brinker, Galacticomm's president and chief executive officer. "There are tools [LANs] for connectivity in-house, and there are these huge commercial on-line services that exist outside of any one company," he said. "What a BBS can do is act like a hub between all these things. It's a guerrilla weapon for information exchange."

Blue Cross/Blue Shield of Illinois uses Galacticomm to electronically collect 990,000 claims a month from doctors and hospitals. It saves up to $1.50 per claim over paper processing, said Mark Flint, lead programmer/analyst.

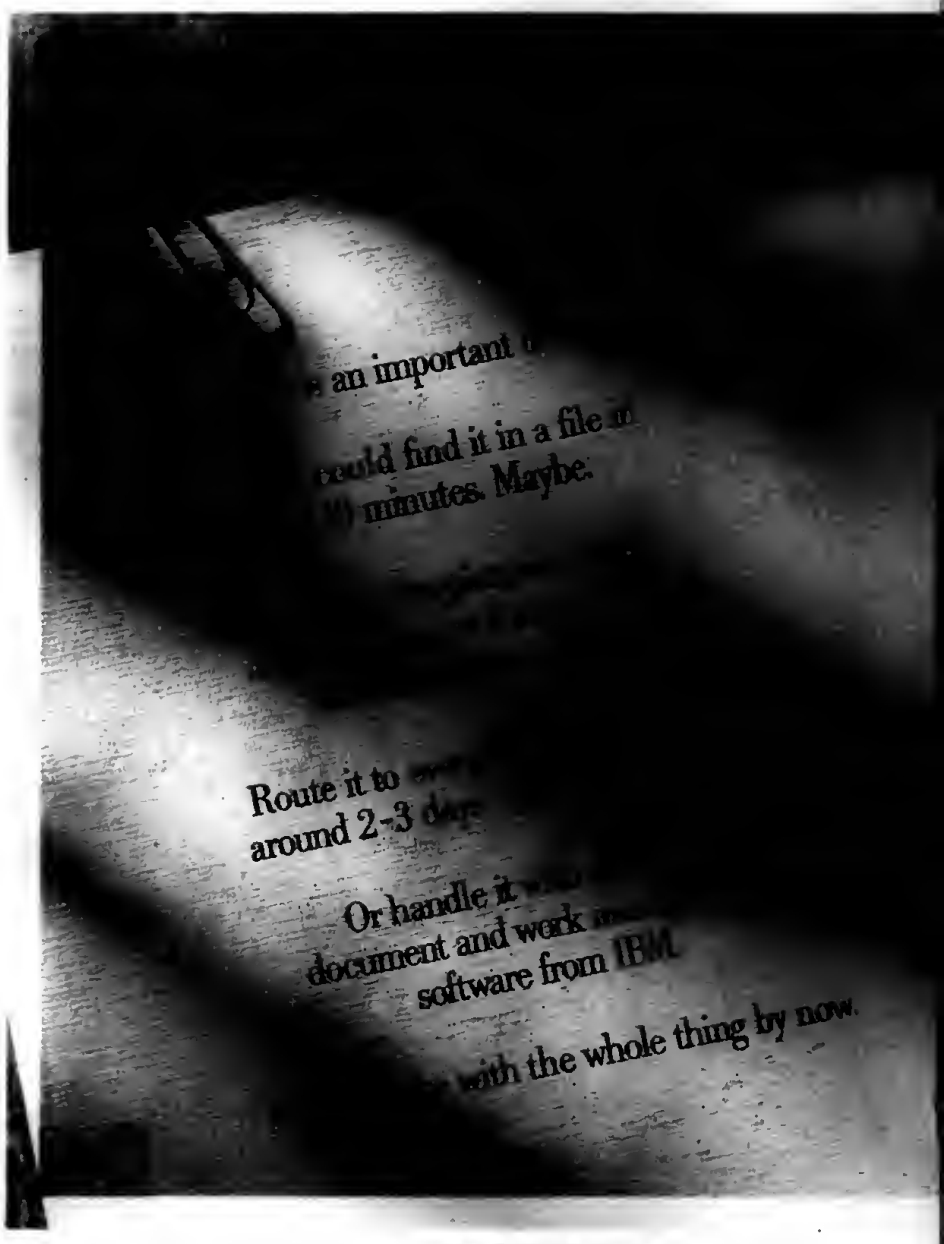
Users dial into The Major BBS and transfer claims collected during the day or week to an Intel 1486-based, 66-MHz PC attached to a Novell, Inc. LAN. When the user logs off, that PC passes the claims to another PC on the network, which does some processing and then sends them to a mainframe.

Overnight, the mainframe prepares claims reports and routes them back to the bulletin board PC where they are appended to E-mail messages for retrieval by the users who submitted the claims. "That saves an awful lot of postage and of course is much quicker," Flint said.

The National Technical Information Service of the U.S. Department of Commerce uses The Major BBS for its FedWorld service, which offers users E-mail and access to hundreds of government databases. It runs on a Pentium-based LAN server and supports 70 modems for dial-up access and 16 direct lines to the Internet for Telnet access.

According to Ken Royer, FedWorld system manager, the service has 74,000 users and supports 3,000 calls a day, many of which pass through a gateway to other federal government BBSs. "This is the place to start if you want to start your own on-line service," Royer said.

He said he is putting two Hewlett-Packard Co. HP 9000 servers on the LAN to support databases from government agencies. They will be searchable using the Internet lookup tool Gopher and text-search tool Wide Area Information Service. "Galacticomm is versatile enough so that we can set it up so that when you see button A, you can hit it and you'll get into this big search system on the HP," Royer said.



ImagePlus & Systems Development has been assessed and registered as meeting the requirements of ISO 9001/EN 29001/BS 5750 Pt 1. These products operate on an OS/2® server. IBM, ImagePlus and OS/2 are registered trademarks and VisualInfo, Flow Mark and DB2/2 are trademarks of International Business Machines Corporation. © 1994 IBM Corp.

Frye Computer Systems, Inc. has introduced The Frye Utilities for Networks-Software Metering and Resource Tracking Version 1.0, a software metering tool.

According to the Boston company, the product is a Novell, inc NetWare Loadable Module tool that addresses the need for managing and enforcing software license compliance for applications and application suites installed on Novell's NetWare-based networks.

Features include a user checkout feature for monitoring software used on stand-alone PCs and the ability to meter popular software suites. The product also has a functionality integrated alerting capability to interface with Frye's NetWare Early Warning System, a utility that monitors network server activity and performance.

The product costs $495 for a 100-user server license and $995 for a 250-user server license. Server licenses for 1,000 users are available for $3,795.

▶ *Frye Computer Systems*
(617) 451-5400

Data Race, Inc. has introduced the Netracer family of connect-on-demand multiprotocol Ethernet bridge routers.

According to the San Antonio, company, Netracer allows users to extend LANs to remote branch offices using dial-up, leased, digital or Switched 56 digital lines.

Netracer features on-demand Ethernet LAN bridging and routing; integrated V.32bis dial-up modem; integrated 10-BaseT, 10Base2 and attachment unit interface connections; Simple Network Management Protocol Agent for remote network management; and a transparent 802.3 Mac layer Ethernet bridge.

Pricing starts at $2,695.

▶ *Data Race*
(210) 558-1900

Enterprise Software Corp. has introduced Net/OverView, a networked systems management product.

According to the Marina del Rey, Calif., company, Net/OverView monitors and reports network service availability, automates network problem diagnosis and associated impact assessment and provides a framework for automated failure recovery.

Net/OverView diagnoses a failure when it occurs, noting the causes along with the impacted users and applications.

Pricing starts at $30,000.

▶ *Enterprise Software*
(310) 305-7721

Advanced Visual Data, Inc. has introduced Visual Simulation, a suite of services for marketing and engineering users in telecommunications companies. Visual Simulation creates animated models of complex systems, services and networks.

According to the Waltham, Mass., company, the product offers customized presentations that represent a variety of components and transactions of telecommunications systems or networks.

Components include routers, switches, bridges, processors and software.

Transactions include data packets, fax transmissions, voice messages and video signals.

Prices start at $10,000.

▶ *Advanced Visual Data*
(617) 890-4300

Product shorts

The Wollongong Group has introduced PathWay Access 3.0 for Windows, an optimal TCP/IP product designed for Windows and DOS applications, client/server tools, network operating systems and database environments. Enhancements for the product include TrueType scalable font support for all terminal emulations and a native Windows user interface for Access applications. The number of sessions is limited only by the number of sockets. Cost: $350 for a single-user license. The Wollongong Group, Palo Alto, Calif. (415) 962-7100. ... **Walker Richer & Quinn** has announced Reflection for 3270, a product that combines TCP/IP-based software with IBM mainframes. The product offers a command-driven architecture, application programming interface support and an integrated scripting language. Cost: $299. Walker Richer & Quinn, Seattle (206) 324-0407.

This is the end of the paper trail.

The end of slow response time. The end of the search for misfiled papers. The end of the routing game. The end of the overflowing in-box. The end of sluggish performance. And sluggish profits.

You've reached the end when you turn everything over to VisualInfo™ and FlowMark,™ the complete client/server imaging and work management solution from IBM that lets your documents live on your PC, not in some distant file folder.

In an instant, you can input paper documents, photographs, text, spreadsheets, scanned images, binary data, even audio and video. And you can deliver the right documents to the right people at the right moment.

Our solution integrates easily with your line-of-business and desktop applications. Combined with DB2/2,™ our client/server relational database, it's an ideal re-engineering solution for small groups or large corporations. It'll let you do more business in less time, serve more customers, and help turn more profit.

Find out more about the IBM family of imaging and workflow solutions. **Call 1 800 IBM-6676, ext. 651.** Turn it over to IBM.

And be done with it.

SOFTWARE FOR DOCUMENT AND WORK MANAGEMENT

IBM®

What PowerBuilder Desktop does best is prove that ObjectView® Desktop is better.

ONLY

Weigh the evidence and you'll see why ObjectView Desktop from KnowledgeWare is the new heavyweight in client/server desktop development. It packs more power than PowerBuilder Desktop, it's easier to use, and it costs less.

Independent benchmarks show that ObjectView applications perform *up to 40 times faster* than those built with PowerBuilder. That fact translates into increased user satisfaction and productivity–and makes you a hero! Plus, you can put ObjectView Desktop to work immediately. While some programmers struggle with PowerBuilder for months–and others never learn it, ObjectView users are developing robust applications in days.

ObjectView Desktop includes a free copy of Gupta's SQLBase–a $399 value–so you can get started right out of the box. It also includes high-performance native database drivers for Oracle, Sybase, Microsoft SQL Server, and Informix. And you can access more than 75 databases and database servers via MDI, Q+E, ODBC, and EDA/SQL, as well as dBase, FoxPro, Btrieve, Paradox, and Clipper. *All at no extra charge!* (You'll pay more than $2,000 for this support when you buy PowerBuilder Desktop.)

Still not convinced? Then buy both. After all, ObjectView Desktop and PowerBuilder Desktop both come with 30-day, money-back guarantees. After you test them head-to-head, return the one that doesn't measure up.

If you're looking for results, don't buy a lightweight power tool. Check out these figures*:

Interpreter performance: ObjectView applications average 7.23 times faster than PowerBuilder applications.

Screen display: Response times for ObjectView applications average 3.3 times faster than PowerBuilder applications.

SQL access: ObjectView applications are 1.7 times faster than PowerBuilder applications.

**Results from Comparative Performance Benchmark, January 1994 Carnegie Technology Group. We'll be happy to send you the complete study. Just ask!*

To order ObjectView Desktop and take advantage of our $199 limited-time offer, call: 1-800-675-2100. We can also fax you more information.

How do you order PowerBuilder Desktop? Well, there's probably an ad in this magazine somewhere. Just be sure to save your receipt!

KnowledgeWare®
Solutions At Work

1994 KnowledgeWare, Inc. ObjectView is a registered trademark of KnowledgeWare, Inc. All other trademarks belong to their respective holders.

THE SQL-SMART
AY TO BUILD
LL-FEATURED
RT/SERVER
CATIONS

Spring Training dBASE for Windows

Join major league developers at dBASE for Windows "Spring Training"

The dBASE® for Windows "Spring Training" seminar series is your best opportunity to get ready for one of the most important software upgrades ever.

Sign up today and you'll get a head start on learning how to use the extraordinary new capabilities of dBASE for Windows. You'll discover why developers are calling it the best way to develop Windows database applications. And you'll receive a full, final release copy of dBASE for Windows when it ships this summer absolutely FREE!

What you'll learn

Come to this **full day seminar** and you'll learn from expert dBASE developers how to get the most out of dBASE for Windows.

- See how easily applications created under any version of dBASE for DOS run directly in dBASE for Windows.
- Learn how to use the dBASE for Windows' new visual design surfaces to quickly create tables, forms, queries, and reports.
- Learn how to leverage your knowledge of dBASE into object-oriented development. You'll learn how to create sophisticated Windows applications in far less time—slashing your development costs. Learn how to create objects, set object properties, attach events and methods, and hook them all together. All using the dBASE knowledge you already have.
- Learn how easily you can build client/server applications for Windows . . . access SQL data from popular database servers . . . or use SQL data in your queries, forms, reports, and applications.
- Learn how the dBASE "plug-and-play" architecture makes it simple to interface your dBASE for Windows applications to other Windows applications and resources. This open, extensible architecture allows you to call any DLL, create custom controls, or use VBX controls.

1994 "Spring Training" Schedule

May 3	*San Diego, CA*	**May 17**	*Minneapolis, MN*
May 5	*Long Beach, CA*	**May 19**	*Dallas, TX*
May 9	*Boston, MA*	**May 19**	*Chicago, IL*
May 10	*Atlanta, GA*	**May 19**	*Phoenix, AZ*
May 10	*Albany, NY*	**May 19**	*Detroit, MI*
May 11	*Tallahassee, FL*	**May 23**	*Columbus, OH*
May 11	*New York, NY*	**May 25**	*Sacramento, CA*
May 13	*Washington, DC*	**May 26**	*Denver, CO*
May 17	*Houston, TX*	**May 27**	*San Francisco, CA*

All Seminars 8:30 A.M.–5:00 P.M. (lunch included)

Attend Spring Training and you get:

Final release copy of dBASE for Windows FREE, when it ships this summer

Full day training from dBASE experts

The latest dBASE for Windows prerelease software

The dBASE for Windows videotape

CompuServe and telephone support

The cost of Spring Training is $495*

Satisfaction guaranteed or your money back

Call 1-800-272-6622, ext. 710

and have your credit card ready

What dBASE for Windows will offer you

There are three major league reasons why dBASE for Windows is the logical path to Windows and client/server for dBASE developers and users:

OUTSTANDING COMPATIBILITY. Your data and applications created with dBASE III PLUS® and dBASE IV® will instantly run under Windows. So you leverage your investment in data, code, and knowledge of the language.

GREATER PRODUCTIVITY. The new visual, interactive design tools give you full control over the Windows environment, and allow you to create your own custom controls.

CLIENT/SERVER READY. With dBASE for Windows you can create Windows applications that are easily scaled up to department-wide or enterprise-wide use. It's simply the best way to "upsize" your desktop applications to a client/server system.

Who should attend

Serious developers! The level of training and technical information you'll receive are designed for developers with at least two years of experience developing applications with dBASE for DOS or a similar DBMS. So if you're serious about building the best Windows database applications . . . register NOW!

Borland

The Upsizing Company™

CALL NOW 1-800-272-6622, EXT. 710

*Price is $595 if you register less than five days in advance. Copyright © 1994 Borland International Inc. dBASE is a registered trademark of Borland International, Inc. BI 7198

Fax software

Lotus to fix glitch in CC:Fax

By Lynda Radosevich

A problem has emerged during beta tests of Lotus Development Corp.'s CC:Fax software that the company said it will fix.

Lotus' fax software does not automatically recognize nontext attachments such as spreadsheet files, and it reacts by dropping the attachments before sending the fax. It does work fine, however, with text-only documents.

"CC:Fax stinks," said Al Petras, a technology director and otherwise congenial CC:Mail user at Boston Edison Co.

While the 2.0 version in beta testing permits users to issue a command that "prints" the document to a fax machine, it requires manual intervention to ensure that the attachments come over with the fax. Therefore, if the fax is to be sent to a large number of people, ensuring the attachments' arrival is even more time-consuming.

Larry Crume, vice president of messaging and mobile computing at Lotus, acknowledged in a recent interview that the problem exists and said the company will work on it. But he did not specify how or provide a deadline for when it will be resolved.

Other options

Meanwhile, Resource Partners, Inc., a small Wakefield, N.H., company, makes a product that automatically handles attachments for CC:Mail faxes.

Another option is available from Keyword Office Technologies Ltd., which recently introduced PostFax, a package said to enable users to send compound documents such as faxes via electronic mail without any tinkering. The software will ship next month. Keyword will install it at customer sites and is working with E-mail vendors to integrate it into their products, the company said.

Messaging

CONTINUED FROM PAGE 63

- GOSIP compliance.
- Bulletin boards with access control that can be replicated among servers.

Users on the EMA show floor appeared to be very interested in OpenMail. Several said they are considering it as an alternative to the Lotus Communications Server and Microsoft's Enterprise Messaging Server (EMS), largely because it is available now and is stable.

Ruth Fleming, a technology analyst at Hallmark Cards in Kansas City, Mo., is one of those interested in OpenMail. However, Hallmark has Microsoft Mail on Windows and Macintosh desktops, and the Macintosh clients cannot run on OpenMail.

Twice the growth

In Fortune 2,000 companies, the electronic messaging annual growth rate is more than twice as high at branch offices than at headquarters: 26% at branch offices vs. 12% at headquarters. Most of the branch offices have LAN-based systems, according to the Electronic Messaging

A Microsoft official suggested that users such as Hallmark wait for EMS, but several balked because Microsoft has not yet committed to a ship date and EMS requires a new operating system, Windows NT Advanced Server.

"Like we want to run mission-critical applications on Release 1.0 software on a Release 1.0 operating system," said a show attendee who wished to remain anonymous.

Banyan messaging products part of broader strategy

Messaging, directory services to cross network operating systems

By Lynda Radosevich

Banyan Systems, Inc.'s first set of messaging products since acquiring electronic-mail provider Beyond, Inc. in February will include a rearchitected messaging service for use with Banyan's Vines or Novell, Inc. networks and a new version of the BeyondMail client for Vines.

The products are part of a broader Banyan strategy to offer network services such as messaging and directory services that can cross network operating systems and hardware platforms. They also tie into the company's plans to offer client software based on Beyond technology as the building block for network applications such as groupware and workflow applications [CW, Feb. 14].

In for the long haul

Both of the recently announced messaging products are aimed at supporting sophisticated message-enabled applications. They signal that Banyan is "positioning itself as a messaging vendor and not just for [its] installed base," said Eugene Lee, a Banyan marketing director for messaging products.

But to accomplish the latter, Banyan must "have better marketing to have appeal beyond the Vines community," said Priscilla Emery, an analyst at New Science Associates in Southport, Conn.

The updated messaging server, called Intelligent Messaging III, will ship in June as a native part of the Vines operating systems and as an unbundled service for NetWare networks. Unix versions are due this year, and a Microsoft Corp. Windows NT version is promised for 1995.

E MAIL

What it costs

Banyan's Intelligent Messaging Server, which will ship June 20, will cost $1,495 per server. The BeyondMail 2.0 client software for Vines will also ship in mid-June and will start at $695 for a 10-user version.

New way to store

Intelligent Messaging's most impressive new feature, according to users and analysts, is its method of storing messages in a database as objects that other applications can use. The technology is similar to that found in Banyan's StreetTalk III directory, which also uses an object model.

That feature could enable a company to send purchase orders to a central message database, where they would be accessible to other applications such as marketing or sales. Also, the order could be automatically routed to accounting, for instance, using rules technology, Lee said.

The Banyan object model "could be a step toward the convergence of forms, E-mail and [electronic data interchange], where you don't have to worry about what the actual message is and whether it's structured or unstructured," said Nina Burns, president of Creative Networks, Inc. in Palo Alto, Calif.

For instance, people can pick attributes to sort and prioritize their messages or slice and dice views on the mail in their mailbox. This is similar to the viewing methods used in Lotus Development Corp.'s Notes, Lee said.

Also, Banyan's model allows applications that are mail-aware, such as a forms-routing application, to share access to messages without conflict. Currently, it is difficult for applications such as workflow and forms to share message and address directory information, so most do not do so.

Additionally, Banyan updated the BeyondMail messaging client to natively use the Intelligent Messaging engine and the StreetTalk directory service. It also upgraded BeyondMail for Vines features to equal the Novell Message Handling System version. BeyondMail Version 2.0 includes rules languages for building workflow applications, imaging capabilities and forms development tools.

Looks promising

For FHP HealthCare, Inc., a managed health care organization in Fountain Valley, Calif., the BeyondMail/Intelligent Messaging combination will be the basis for an application that automatically routes trouble tickets from the company's help desk to the appropriate people, according to information systems specialist Brian Ledsworth.

"We want to send the forms not just as an attachment but as a piece of data that we can process at the other end," Ledsworth said.

Although FHP HealthCare has not built the application yet, the combination of the object store technology in Intelligent Messaging and the forms and rules in BeyondMail looks promising, he added.

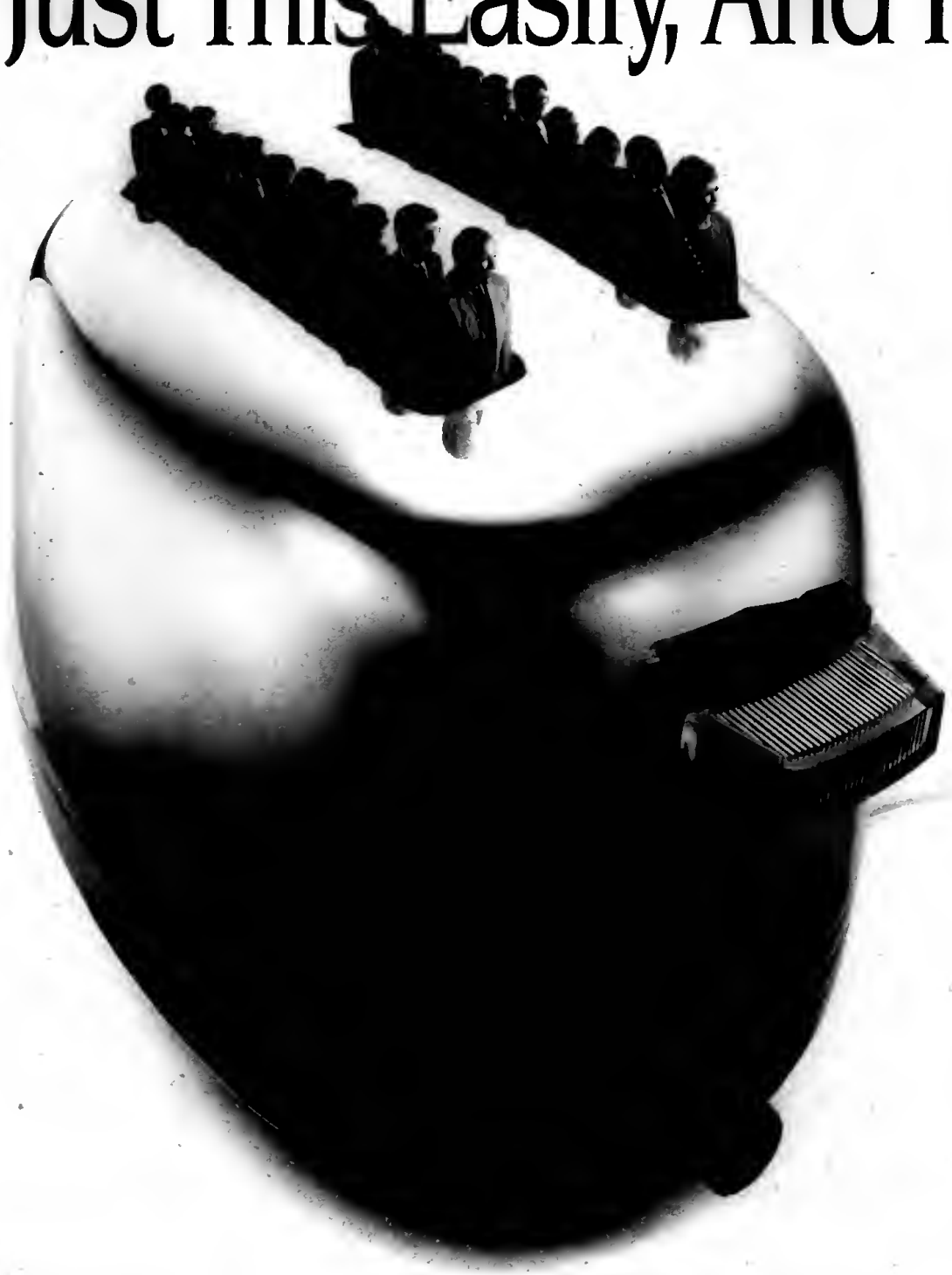
Intelligent features

The following are features of Banyan's Intelligent Messaging III:

- **Object message store:** A single container for multiple mail-based and mail-enabled application objects.
- **Object database:** With a "dynamic envelope" feature, applications can create and manage their own electronic envelope of information containing transport directions without interfering with other applications in the same user's mailbox. This allows applications developers to build specific data types, which can be used by other applications.
- **Advanced query support:** Messaging clients can build simple or compound queries.
- **Different viewing methods:** Messaging applications can request a list of messages in a database folder sorted by the value of an envelope field. The same data can be viewed in different ways.
- **Shared mailboxes:** Many users can access a single mailbox. Intelligent messaging has controls.
- **MAPI 1.0 support:** Messaging Application Programming Interface (MAPI) clients, including a free client that will be bundled with Windows 4.0, can access Intelligent Messaging services.
- **Performance enhancements:** Servers can support more message traffic. Query and sort speeds are improved.
- **Management capabilities:** Alerts signal the manager for various events. Also, the server can be monitored or queried from Simple Network Management Protocol stations.

—*Lynda Radosevich*

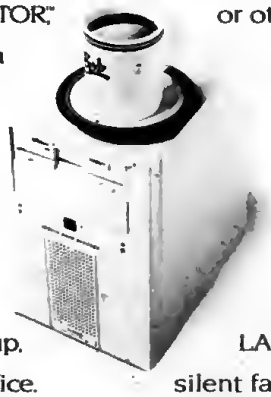
Pop Your Users Into Just This Easily, And For



Our Personal Server Not Much More Bread.

Remove wrapper. Plug in. Serves a bunch.

It's nearly that easy with Z-STOR™ the new workgroup server from Zenith Data Systems that thinks it's an appliance. And like an appliance, the Z-STOR can be set up in minutes, allowing you to quickly connect desktop and notebook computers to a small workgroup, or remote users to a central office.



When industry leaders coined the term "Plug and Play," they had products like Z-STOR in mind. Z-STOR is so easy to operate, switching the power on and off is all you need to worry about. And it automatically reconfigures itself at start-up whenever you add users or change drives. Plus, with Personal NetWare™ pre-loaded, the Z-STOR integrates seamlessly into the corporate NetWare® environment.

Expanding Z-STOR is easy as well. Its PCMCIA slot accommodates a high-speed modem for remote access, a Token Ring adapter or system recovery card. And snap-in expansion bays can house a CD-ROM drive, tape back-up, or other mass storage devices, providing up to five gigabytes of internal storage.

We should also mention the parallel port that enables fast print sharing. Built-in Ethernet, which provides affordable LAN connectivity. The almost silent fan. And our Energy Star-compliant* power supply that draws less than 30 watts.

All this is packed into a chassis that's not much larger than a toaster. Meaning the Z-STOR fits under your desk, on the bookshelf, in the wiring closet, just about anywhere. Another example of how ZDS™ makes connecting computers, and people, easier than ever.

yes NetWare Tested and Approved

Oh, one more point. At just $999.** Z-STOR is easy to own. So call us, and find out why the Z-STOR personal server is the best thing since sliced, well, you know.

1-800-289-1320, Ext. 5111

ZENITH DATA SYSTEMS

MAKE THE CONNECTION™

Copyright © 1994 Zenith Data Systems Corporation. Zenith Data Systems Corporation is a Bull company. Z-STOR, ZDS and "Make The Connection" are trademarks of Zenith Data Systems Corporation. NetWare is a registered trademark, and Personal NetWare is a trademark of Novell. The Energy Star logo is trademark of the Environmental Protection Agency. *Installing a CD-ROM drive nullifies Energy Star compliance. The EPA, as a matter of policy, does not endorse companies or products. **Z-Direct price. Prices and specifications subject to change. Resellers determine their own prices which may be higher or lower than the Z-Direct price.

Push-button recovery

DB2 Automated. Accurate. Adaptable. That's BMC Software's push-button recovery solution — RECOVERY MANAGER for DB2®.

RECOVERY MANAGER automates and manages your recoveries. It provides detailed analysis and efficient recommendations on what needs to be recovered and how. It encompasses everything, from grouping related objects to generating JCL and control cards.

Nothing is more thorough or more accurate. The only way to improve DB2 recovery is to have RECOVERY MANAGER invoke BMC's RECOVER PLUS and COPY PLUS, the industry's fastest DB2 recover and copy utilities.

Multi-platform recoveries

Recoveries aren't limited to DB2. Neither is BMC Software. That's why BMC has developed an enterprise-wide recovery strategy – both on the mainframe and off.

IBM Business Partner

To find out more about push-button recovery management, call us today at **800 285-4BMC** or 713 918-8800.

BMC® SOFTWARE

The Experience. The Technology. The Future.

BMC Software international offices are located in Australia, Canada, Denmark, France, Germany, Italy, Japan, Netherlands, Spain and the United Kingdom. BMC Software is a registered U.S. trademark of BMC Software, Inc. DB2 is a registered trademark of International Business Machines Corp. ©1994 BMC Software, Inc. All rights reserved.

Is the OSF's DCE ready for the big time?

By Jean S. Bozman

The Open Software Foundation's (OSF) Distributed Computing Environment (DCE) is being readied for prime-time production applications at some leading-edge sites, and DCE development is gathering steam. But industry analysts and early users predict DCE will not be widely used until 1996, in part because of concerns about its scalability and lack of strong systems management tools.

DCE offers users a way to forge a single client/server computing environment for different types of Unix computers, PCs and mainframes. (For a more detailed explanation of DCE, see the chart below.) Without DCE, users have had to cobble together software modules from different sources — and write some of their own code — to get the job done.

Much of DCE's potential is still bottled up in prototype networks and DCE test beds at corporate and university sites, users and analysts said. The actual number of production DCE sites is still small — fewer than 100 worldwide, according to some estimates.

But a second wave, with hundreds more production sites, is expected in the next 12 months. Among those most ready to "install" DCE cells are Wells Fargo Bank in San Francisco, Mead Data Central in Dayton, Ohio, and Goldman, Sachs & Co. in New York.

In fact, users at some sites said they cannot wait for vendors to adopt all facets of DCE code. For example, Stanford University has had a client/server distributed network in place for three years, accomplished by piecing together its own DCE equivalents (see related story page 75).

Still, the concept behind DCE is a powerful one, particularly in an era of global competition. "The notion of the network vs. the local cell disappears completely," said Kevin P. Tyson, a consultant working on a DCE project at Goldman, Sachs, an investment house in New York. "There is no difference between accessing the server on your local workstation or on the other side of the world."

Multiple server access

The advantage of using DCE is that, with one user logon, any client can reach any DCE server, regardless of the databases or operating systems used on each server machine. At Lehman Brothers in New York, business units are sponsoring a DCE effort that will allow them to launch financial applications across Unix workstations and PCs. Mead plans to use DCE to support systems management applications linked to a Hewlett-Packard Co. OpenView network manager, users there said.

"It's still more the leading-edge people and the experimenters in the organization," said Richard Villars, director of network architecture research at International Data Corp. in Framingham, Mass. But current development will spur production DCE cells in the future. He added it will probably be two years before massive DCE deployment occurs.

DCE, *page 75*

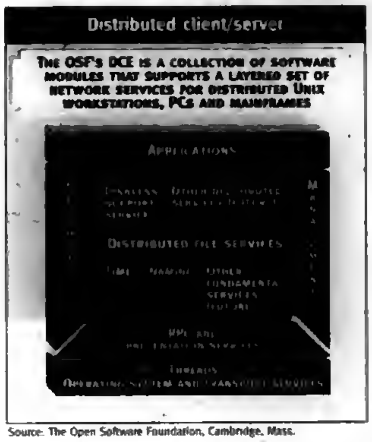
Glossary

• Distributed Time Services: Synchronizes the global "time" throughout the DCE network, updating security and audit functions through time stamps.

• Cell Directory Service: Provides a directory on one or more DCE servers that lists all network resources and data files available to clients.

• Global Directory Service: A broader listing of all network services and data files scattered throughout multiple DCE cells. Cells, which are groupings of DCE clients and DCE servers, are connected by private network links or by the Internet. Some users said they will employ the X.500 standard for file naming.

• Remote Procedure Call (RPC): A protocol that links all DCE clients to DCE servers. It is independent of proprietary RPCs used by relational database management products.



Source: The Open Software Foundation, Cambridge, Mass.

• Distributed File Services (DFS): A successor to the widely used Andrew File System (AFS) developed at Carnegie Mellon University to support distributed computing. Transarc Corp. will provide an AFS-to-DFS migration kit in the third quarter.

• Security Service: Based on Kerberos, a security program developed at MIT, this watchdog provides authentication of all approved users.

• Threads: Based on the threads interface in the Posix standard, each thread supports a single data flow within a program.

Brokerage replaces DASD storage with disk arrays

By Thomas Hoffman

Prompted in part by its recent decision to "insource" key operations like money market funds processing, Edward D. Jones & Co. has achieved early benefits from replacing its mainframe direct-access storage devices (DASD) with smaller and quicker disk-array subsystems, according to company executives.

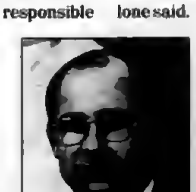
Jones, a Maryland Heights, Mo., brokerage, replaced IBM and Hitachi Data Systems Corp. DASDs offering 120G bytes of storage capacity with a 180G-byte EMC Corp. disk-array subsystem for its IBM 3090 600J mainframe computer in January. The EMC Symmetrix 5500 disk-array subsystem, a 17-sq.-ft. refrigerator-size unit, occupies one-fifth the floor space that Jones' DASDs required.

More importantly, there is room to grow within the EMC cabinet. The new disk-array subsystem, now running at 50% capacity, has increased Jones' data storage capacity to 400G bytes, according to Rich Malone, principal responsible for the firm's information services division.

Untapped resources

The brokerage therefore has plenty of untapped capacity as it keeps reining in operations that support its 2,900 branches. For example, Jones' money market funds processing had been outsourced to third-party vendors such as Automatic Data Processing, Inc. Jones is bringing those tasks back in-house during the course of this year.

"We're going to take over most of those [outsourced] functions, and the Symmetrix machine is going to help get us there since it's more efficient to do this processing on-line than in batch mode," Malone said.



Rich L. Malone. *Symmetrix array will facilitate 'insourcing'*

Furthermore, the EMC disk-array subsystem helped the brokerage be more responsive to customers during the past month, in spite of frenzied stock market activity. For example, the brokerage broke a company record last month when it processed 6.5 million IBM CICS transactions in a single day when the stock markets were on a particularly wild ride.

Compared with the former DASD machines, the disk-array subsystem has knocked nearly half a second off the company's data response time, thanks to improved I/O capabilities, Malone said. In a setting where a million dollars can be won or lost each second, I/O performance is critical. "I'm convinced that [the disk-array subsystem] helped us during those high-volume days," he said.

Industry analysts said customers who have switched from DASD to faster disk arrays achieved performance gains of up to 30%. "People who have replaced IBM DASD with EMC subsystems are getting better response times, and IBM can't quite compete with them at the very high end," said Robert Callery, a storage analyst at International Data Corp. in Framingham, Mass.

Even though IBM is expected to unveil RAID Level 5 products next month and in October, Callery said the systems will continue to fall short of EMC's performance capabilities.

Available only in Computerworld!

Give the gift of laughter.

What's so funny about technology?

Plenty — especially if you follow the cartoons of Rich Tennant in *Computerworld*.

The fact is, Tennant's whimsical "5th Wave" series has brought smiles to the faces of hard-working *Computerworld* readers since it first appeared in 1990.

Now we've taken some of his all-time funniest cartoons and turned them into a line of custom products that are guaranteed to delight and amuse.

Having trouble finding the right gift for a business associate who's just been promoted? Looking for an affordable birthday present for a co-worker? Need creative holiday gifts for client's in the IS industry?

Computerworld products are just the ticket.

You don't need a special occasion to give a *Computerworld* gift. But you do need to order right away, since supplies are limited.

Just fill out the attached form or call us at 1-800-222-7545 or fax your order to (508) 626-8258. And give the gift of laughter.

ORDER FORM

To order a Computerworld gift, fill out this form and fax or mail it to:

COMPUTERWORLD
P.O.Box 9171
Framingham, MA 01701 U.S.A.
Attn: Product Fulfillment

Can't wait?
Call 1-800-222-7545 or
Fax (508) 626-8258
(Monday-Friday 8:30-5:30 EST)

SHIP TO:

Name

Company

Address (Please use street address, UPS does not deliver to P.O.Box)

City State/Province Zip/Postal Code

Country

( )
Daytime Phone

To order: Fax 508-626-8258 or Call 1-800-222-7545.

	Item	Price	Quantity	Amount
C1AD3	Mug	$7.99		
C2AD3	Sip-it	$7.99		
C3AD3	Mousepad	$4.99		
C4AD3	T-shirt	$15.99		
C5AD3	Sweatshirt	$24.99		
C6AD3	Duffle	$16.99		
C7AD3	Tote Bag	$12.99		

AVOID DELAY! Please include Shipping & Handling. If your merchandise (subtotal) is

UP TO	$10.00		$2.50
$10.01	- $20.00		$3.95
$20.01	- $35.00		$4.95
$35.01	- $50.00		$6.95
$50.01	- $100.00		$9.95
OVER	$100.00		$13.95

* For Canada and International orders, please add $5.00 per item for Shipping and Handling

Subtotal	
Shipping & Handling*	
Sales Tax**	
Total	

** Residents of MA, CA, NJ, GA and DC, add applicable sales tax. Canada residents add G.S.T.

Method of Payment (in U.S. dollars only)

Check or Money order payable to: **COMPUTERWORLD**

❑ VISA ❑ MC ❑ AMEX

Card No.

Exp. Date

Signature

Your credit card will not be charged until your items are shipped.

Thank you for your order!

COMPUTERWORLD
The Newspaper of IS

Don't Get Left Behind!

Introducing

POWER PC WORLD™

If you want to keep pace with the next generation of computers, you want to read Power PC World. It's all you'll ever need to know about tomorrow's technology. TODAY.

The Debut of the Decade.
It's no secret. The PowerPC is about to make its grand debut. And when it does, it's going to revolutionize your processing capabilities...push your PC to the limit...run circles around conventional computer standards.

You need to know more.
Power PC World gives you knowledge. Helps you make the PowerPC transition. Answers your questions. About integration and compatibility...which Mac models are the best candidates for upgrades? When's the right time to buy? What development tools are available.

FREE ISSUE.
Check out Power PC World for yourself, with the next issue. FREE. If you like what you see, you can subscribe at the low charter rate of $49. You'll get five more information-packed issues of Power PC World — a total of six in all. If you're not completely impressed, you can mark "cancel" on our invoice and owe nothing. The FREE issue is yours to keep.

Don't get left behind.
Make sure you are part of history in the making. Watch closely as the evolution of the PowerPC unfolds. Send for your free issue of Power PC World — today!

FREE ISSUE!

CHARTER OFFER

Yes! Send me a free issue of Power PC World. If I like it, I'll pay the low charter rate of $49 and receive five more issues (a total of six issues in all). If Power PC World is not for me, I'll simply write "cancel" on your invoice and owe nothing. And the FREE issue is mine to keep.

name _____

company _____

address _____

city _____ st. _____ zip _____

501 Second Street
San Francisco, CA 94107
4CWI

POWER PC WORLD

RUSH MY CHARTER SUBSCRIPTION!

No Postage Necessary If mailed in the United States

BUSINESS REPLY MAIL
First Class Mail Permit No. 24577 San Francisco, CA

POWER PC WORLD™

501 Second Street
San Francisco, CA 94107

Is DCE ready for the big time?

CONTINUED FROM PAGE 73

Scott Winkler, a Unix analyst at Gartner Group, Inc. in Stamford, Conn., agreed. "At minimum, it's 24 months before the average organization is developing with it," Winkler said. The recent revamp of the OSF has also called DCE's future into question for some users [CW, March 28].

But the OSF has said DCE development is still going strong, and it will ship DCE 1.1 — now in beta testing — in November. At that point, the OSF will hand over DCE development to a task force of OSF vendor members likely to include IBM and HP.

"It does not appear that it will get derailed," Winkler said, "but it could be a slow burn." Analysts have some questions about the mechanics of which vendor will handle which pieces of DCE development once the transfer occurs.

Not a holdup

Nevertheless, users implementing DCE do not appear to be letting that slow them down. To date, most of the leading-edge DCE sites have started their projects with a small task force, often a team of just three to five people, and have usually tapped independent consultants for their DCE expertise. Most built test bed DCE "cells" with 10 to 30 workstations and PCs to prove the concept to corporate business units that were funding the DCE work.

During the prototype phase, users tested DCE scalability and the interconnection of multiple cells. The next step was production, as typified by San Francisco investment house Charles Schwab & Co., which installed a DCE cell of Unix workstations, PCs and mainframe links in Phoenix [CW, Dec. 6, 1993]. If the first DCE cell works well, more will be installed nationwide at Schwab's regional sales offices, users in Phoenix said.

Doubts remain

Despite the optimism, some concerns about DCE — including its scalability and the lack of industrial-strength systems management tools — may hamper its widespread adoption. Although DCE can theoretically handle networks of thousands of computers, some users worry about doing so.

"You have to be able to know what's going on," said Art Gaylord, director of Project Pilgrim at the University of Massachusetts at Amherst, which is developing DCE networks for campuswide use. "Until you get good instrumentation, it's like trying to drive your car with your eyes closed." Other users are awaiting wider support for Microsoft and Novell, Inc. PC LANs.

David Lounsbury, director of the OSF's distributed environment engineering group, said some of those services will be included with DCE 1.1. Among them: a new DCE Control program to manage all DCE core services and a DCE Cell Manager that was demonstrated at UniForum in late March.

The unknown

Still, DCE is an unknown quantity to most users who will evaluate it in 1994 and 1995. "It's on everybody's to-do list, but we find that a very small number of users are able to articulate what it will do for them," Winkler said. "They're not sure what it is and what it's going to do to help them."

But for some users trying to adopt networking without boundaries, DCE is proving its worth.

"The great advantage of DCE is [it's] not only an infrastructure for Unix, it's an infrastructure for any operating system, mainframes included," said Serban Grecenau, a DCE consultant at Lehman Brothers. The firm has mainframes, approximately 4,000 Unix workstations and 4,000 PCs.

"That makes it more attractive to everybody," Grecenau said.

Not for Unix only

Although DCE started on Unix machines, users expect its value to be in linking up a heterogeneous computer network. IBM began shipping its MVS-compatible DCE package in April, and a VM version is in the works. PC support is still limited, but Gradient Technologies, Inc. ships a package for Windows. So far, mainframes and PCs are being used as DCE clients only. However, Digital Equipment Corp. is preparing a full DCE port for Microsoft's Windows NT, which would allow NT to be a DCE server. It is due later this year.

OLTP added

Last year, users developing DCE applications worked on getting the core DCE services up and running reliably. This year, as early DCE production applications roll out, users are adding on-line transaction processing (OLTP) software to the mix.

Without OLTP, a lot of DCE computing would revolve around decision support and data access — and not much more. Adding OLTP functions to the DCE core services eases the migration of transaction-oriented mainframe applications to client/server systems. But it also brings headaches, such as worries of forcing too much data traffic onto the corporate network.

There are several ways to "layer" OLTP functionality on top of the basic software strata of DCE services. Transarc Corp.'s Encina is the leading example. Transarc has already linked DCE's core services to the Encina OLTP monitor and Encina file services.

Encina was also the basis for IBM's CICS/6000 and HP's HP Encina/9000 client/server OLTP products. Tandem Computers, Inc., which will support CICS, DCE and Novell's Tuxedo OLTP monitor, has focused on "delegated commits," which allow client requests to trigger server transactions.

—Jean S. Bozman

Migration inevitable for Stanford

Stanford University crafted its networked computing environment three years ago without using DCE software. Its distributed network is based on the Andrew File System (AFS) from Carnegie Mellon University and Sun Microsystems, Inc.'s Network File System, along with some custom software.

The campus has more than 2,000 Unix workstations acting as peers — and 19,000 user identifications, because people share computers. "Anyone on campus who has AFS installed can access their files from anywhere in the world," said Roland Schemers, a systems programmer in Stanford's distributed computing operations group. But first, AFS 3.2's Kerberos security program authenticates all user IDs before allowing access to the distributed data servers.

The reluctance to install DCE stems from a lack of broad DCE support for PC LANs, said Raman Khanna, director of networking and distributed computing. "If I had to maintain a Unix-only environment, I would go to DCE real fast," he said. "But there's no current buy-in from the Microsofts and Novells and Apples of the world." Khanna said the campus also has 10,000 Macintosh machines and about 5,000 IBM-compatible PCs.

Stanford paid a price in its quest to enter the world of distributed computing in the early 1990s. "Basically, we're writing our own homegrown software," Schemers said, using the C language and the "Perl" scripting language.

But a migration to DCE is practically inevitable starting in 1995, Khanna said. The first step will be to replace the Internet's Domain Naming Services for the DCE cell directory and DCE global directory, using the X.500 standard for naming files. The second step will be to migrate from AFS to DCE's Distributed File Services.

"We've been able to create an environment for a subset of our community," Khanna said, "and we'd really like to migrate all of Stanford, including administrative computing, to a distributed computing environment."

—Jean S. Bozman

Briefs

Recovery for Tandem

Comdisco Disaster Recovery Services said it has expanded its ability to recover Tandem Computers, Inc. computers by increasing the number of Tandem machines at its Wood Dale, Ill., facility.

IBM unveils storage

IBM took the wraps off high-end storage devices for its RS/6000 customers. Based on RAID 5, the 3514 Models 212 and 213 include a 1G- or 2G-byte drive priced starting at $3.40 per megabyte.

EMC backs up AS/400s

EMC Corp. has introduced storage devices for IBM AS/400 machines. The Voyager 3490 E series provides up to 48G bytes of backup capacity. EMC also said its Harmonix Integrated Cached Disk Array will support RAID 0, 1 and 5.

AT&T, Red Brick team

AT&T Global Information Solutions (formerly NCR Corp.) and Red Brick Systems are jointly marketing Red Brick's data warehousing software.

ASK takes Q3 hit

The ASK Group, Inc. posted a $69 million loss for its fiscal third quarter 1994, due in part to a $45 million restructuring charge, the company said. The database and applications maker reported $87 million in sales for the period, compared with $82 million in the same period last year. More than 400 workers have been laid off since Jan. 1. ASK plans to trim 100 more people by July through layoffs and attrition, a spokeswoman said.

IBM signs contract

System Software Associates, Inc. and IBM signed a development and marketing agreement last week that focuses on System Software Associates' software for the IBM AS/400 and RS/6000 platforms. Among other components, the agreement will include marketing campaigns for specific market segments.

D&B, PeopleSoft battle in human resources arena

By Rosemary Cafasso

The client/server human resources applications market is about to get more contentious now that Dun & Bradstreet Software has made its official entry, and market leader PeopleSoft, Inc. is not about to give an inch.

D&B Software, one of the leading providers of human resources software for the mainframe world, has targeted the client/server human resources applications market for more than two years. Last week, it launched HR Stream Release 1.0, expected to ship in June.

The software includes basic human resources functions and built-in workflow software to help automate processes. It was also designed with an enterprise model blueprint of human resources information intended to help customers design or redesign their human resources function.

Meanwhile, PeopleSoft rolled out HRMS 4 on the same day of D&B Software's launch. The Walnut Creek, Calif., company built an installed base of approximately 300 customers while D&B Software and other host-based suppliers were still developing their products.

The new PeopleSoft software, scheduled for delivery in July, includes additional human resources functions such as training administration, succession planning and Consolidated Omnibus Budget Reconciliation Act administration.

In addition, Oracle Corp. recently announced client/server versions of its human resources software. Oracle ranked third in the client/server human resources market with approximately $10 million in 1993 revenue, according to a recent International Data Corp. (IDC) survey.

Market leader

PeopleSoft leads the client/sever human resources software market with about $30 million in 1993 revenue and a 33% market share, IDC said.

Observers said the companies are shoring up their installed bases. For D&B Software, that means helping to migrate host-based users to the new platform. For PeopleSoft, it means catering to customers who already switched to a client/server setup.

"PeopleSoft has some lead time before Dun & Bradstreet becomes a direct threat," said Claire Gillan, director of applications research at IDC. Further, she said D&B Software "will still need to prove themselves. They really only have two beta sites."

Fierce competition

D&B Software's HR Stream, which the company said was built from the ground up, was designed to work with the Sybase, Inc. database management system. It includes several modules that address key aspects of the human resources process, including a base human resources management component as well as recruitment, employment, compensation and training and government compliance modules.

Ralph Horner, director of the human resources information systems project at Weyerhaeuser Co. in Tacoma, Wash., said he has been an early test customer for D&B Software since late 1992. He said he has given the company a large amount of feedback and believes it added some functions based on his input.

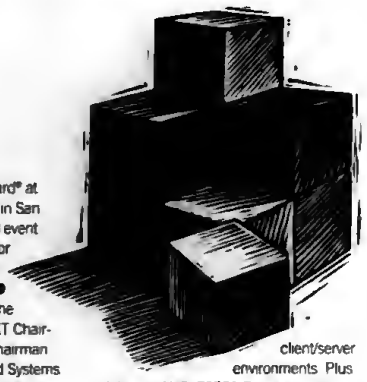
"For us, it really did fit our needs," Horner said. "It's flexible enough that you can almost pick and choose the modules."

HR Stream includes workflow technology that allows customers to create a human resources process with automated routing and messaging.

Bobby Cameron, a senior analyst at Forrester Research, Inc. in Cambridge, Mass., said if D&B Software has an advantage over PeopleSoft, it stems from its workflow design, which was built as a core component of its human resources platform.

PeopleSoft, on the other hand, is now trying to incorporate similar technology into an existing product line.

THE SUBJECT IS OBJECTS.



Join NeXT,™ Sun,® and Hewlett-Packard® at the Third Annual NEXTSTEP™ EXPO in San Francisco. This four-day international event is your opportunity to see all the major trends in object-oriented computing converge in one place. **STEVE JOBS AND SCOTT MCNEALY, KEYNOTES.** Hear from the people behind the companies—NeXT Chairman Steve Jobs, Sun Microsystems Chairman Scott McNealy, and Hewlett-Packard Systems and Servers Group General Manager Rich Sevcik. **DEVELOPER AND USER CONFERENCE.** Whether you're a new or seasoned NEXTSTEP developer, we'll provide you with opportunities to learn more about objects. Get three full days of conference sessions—addressing various topics on object-oriented computing and the development of applications and systems in client/server environments. Plus one full day of NEXTSTEP Tutorials, designed to help you learn even more. **MORE FIRSTS.** NeXT will unveil the first object framework for reusable business objects that combine business logic with persistent storage in industry-standard relational databases. It's called Enterprise Objects Framework™, and all Developer and User Conference attendees will receive a free early-access copy. Hewlett-Packard will launch the first PA-RISC NEXTSTEP workstations. And the EXPO will be your first opportunity to get more details on the published OpenStep™ specification—the open object standard NeXT and Sun are championing. **THE BIGGEST EXPO YET.** You'll see the latest NEXTSTEP solutions for Intel, Sun, and Hewlett-Packard computers. You'll hear the latest thinking from industry luminaries. You can visit over 120 exhibits from major PC and workstation manufacturers, software developers and systems integrators. And instead of waiting years for other companies to deliver their object technology, you can see it all this June. **BE THERE.** For information or to register, call **(800) 767-2336** (Outside the U.S. and Canada, call (508) 474-9258).

NEXTSTEPEXPO'94

At Moscone Center in San Francisco. June 20 - 23.

©1994 NeXT Computer Inc. All rights reserved. NeXT, NEXTSTEP, OpenStep and Enterprise Objects Framework are trademarks of NeXT Computer, Inc. All other trademarks mentioned belong to their respective owners. BRCXV00

Hewlett-Packard® business servers help Home Depot keep their prices low. And their growth rate high.

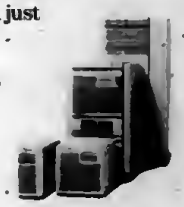
"This technology gives us the flexibility we need for the future."

— Ron Griffin, VP Application Services, The Home Depot

In just 14 years, Home Depot's low warehouse prices and high level of customer service have made them the #1 retailer in the home improvement market. And a household word in the business community, too.

Their record growth rate also overwhelmed their old computer systems. So they picked HP 9000 Series 800 replicated servers and Informix's OnLine RDBMS to replace them. Now hundreds of these in-store processors, linked via satellite to multiple data centers, give Home Depot another competitive edge.

Beyond technology, HP's expertise in Open Systems helped sharpen it. With consulting, planning and on-site instruction. As well as worldwide service and support. And, adds Ron Griffin: "HP's system engineers had more UNIX® experience than anyone else. We were able to convert all our stores in just five months."



For details on how HP has helped other companies, call 1-800-HP-KNOWS. We'll help build a success story for you.

HEWLETT® PACKARD

UNIX is a registered trademark of UNIX System Laboratories, Inc. in the U.S. and other countries. ©1994 Hewlett-Packard Company 5SY9401

[redacted]

EMC Corp. has announced the Voyager 3490 E series, storage products for the IBM AS/400.

According to the Hopkinton, Mass., company, the series provides high-capacity 36-tape backup for Models 9404 and 9406 of the AS/400.

The company also offers the SL6 series direct-access storage device (DASD), which provides high-performance disk storage for 9404 AS/400 users.

The Voyager 3490 E series combines unattended backup capabilities with high transfer rates that enable users to manage growing data volumes and shrinking backup windows.

The SL6 series DASD lets 9404 AS/400 users increase their system and expansion unit capacity by providing users with 400M bytes to 3.92G bytes of permanent storage on 3½-in. disks.

Voyager E series prices range from $35,225 to $64,250; the SL6 series DASD ranges from $2,500 to $6,100.

▶ *EMC*
(508) 435-1000

Generic Software, Inc. has introduced Deskworks Release 4.2, an interactive spreadsheet program for IBM's AS/400.

According to the Madison, Miss., company, enhancements for the product include a Retrieve Data from External Lotus Cell function that returns the value of a cell or range in a Lotus worksheet file that is contained in an AS/400 shared folder.

The Retrieve Data from External Cell function now supports referencing a range in an external spreadsheet and as a single cell.

The Return Cell Attribute, Relative Cell Value, Indirect Cell Value and Table Lookup functions have been enhanced to support external references.

Deskworks Release 4.2 costs $695.

▶ *Generic Software*
(601) 853-1189

Transition Engineering, Inc. has introduced the PowerStar III active UTP Repeater for S/3X and IBM AS/400 environments.

According to the Eden Prairie, Minn., firm, the PowerStar III offers a cost-effective method to convert twin-axial daisy chain networks to a low-cost unshielded twisted-pair, star-wired configuration.

The PowerStar III is available in either one-host/seven-device or two-host/14-device configurations. Host/device connections are provided through either RJ-t1 or RJ-45 connectors.

The PowerStar III costs $600 for a single-host/seven-device unit and $t,200 for a two-host/t4-device unit.

▶ *Transition Engineering*
(612) 941-7600

FlexiWare Corp. has announced that its FlexiFinancials client/server financial application system is interoperable at code-specific levels with Sybase, Inc.'s SQL Server 10 relational database management system.

According to the Shelton, Conn., company, the combination of FlexiFinancials and the SQL Server 10 enterprise features high on-line transaction processing rates; complete data integrity and disk mirroring backup; transparent read/write access to any network-connected data source; access to a variety of popular desktop and server hardware and software systems; and large user population support.

FlexiFinancials is available in FlexiLedger and FlexiPayable modules with prices ranging from $50,000 to $t00,000 per module.

▶ *FlexiWare*
(203) 925-3040

Software Engineering of America has introduced the Tape2000 Release 4.2, an automated tape library management system for MVS, MVS/XA and MVS/ESA environments.

According to the Franklin Square, N.Y., company, Tape2000 features full retention control, real-time access through ISPF for on-line tracking and management, scratch protection/verification, off-site vault management, full security, multiple-system/parallel processing support, multifile/multivolume support and tape silo support.

Prices for Tape2000 range from $20,800 to $66,900.

▶ *Software Engineering of America*
(516) 328-7000

"You can be a sheep, or the shepherd."

The choice gets more critical.

The continuing explosion in information technologies is providing unprecedented opportunities for products, services and vendors.

The competition knows it.

Being informed gives the winning edge to the corporate executive who moves on to fresher fields, while the others contentedly graze the old.

For that reason, CW Custom Publications created The White Paper Program, The Computerworld Solutions Series, and multi-sponsored supplements offering inside information on emerging technologies. We work with giants like Motorola, Apple, OSF, Price Waterhouse, Oracle, IBM, UniForum, AIIM, SunSoft, OMG and many others.

Watch for CW Custom Publications–produced for the corporate leader who has learned that the first one to move ahead never has to fear being left behind.

Custom COMPUTERWORLD Publications.

FOR MORE INFORMATION, CONTACT CAROLYN NOVACK, PUBLISHING SERVICES DIRECTOR, CW CUSTOM PUBLICATIONS, BOSTON 1 800 343 6474

©1993 Computerworld Custom Publications

Fill it out. Fax it in. Save $8.

FAX NO. 508-626-2705

Yes, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $39.95* per year - a savings of $8.00 off the basic subscription price.

First Name MI Last Name

Title Company

Address City State Zip

Address Shown ❑ Home ❑ Business ❑ New ❑ Renew Basic Rate $48 per year

* U.S. Only. Canada $95, Mexico, Central/South America $150, Europe $295, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the questions below to qualify for this special rate.

1. BUSINESS/INDUSTRY (Circle one)
10 Manufacturer (other than computer)
20 Finance/Insurance/Real Estate
30 Medical/Law/Education
40 Wholesale/Retail/Trade
50 Business Service (except DP)
60 Government - State/Federal/Local
65 Communications Systems/Public Utilities/ Transportation
70 Mining/Construction/Petroleum/Refining/Agric.
80 Manufacturer of Computers, Computer-Related Systems or Peripherals
85 Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90 Computer/Peripheral Dealer/Dist./ Retailer
95 Other_____ (Please Specify)

2. TITLE/FUNCTION (Circle one)
IS/MIS/DP MANAGEMENT
19 Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21 Dir./Mgr. MIS Services, Information Center
22 Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr. /PC Mgr., Tech Planning, Admin Svs.
23 Dir./Mgr. Sys. Development, Sys. Architecture
31 Programming Management, Software Developers
41 Engineering, Scientific, R&D, Tech. Mgt.
60 Sys. Integrators/VARs/Consulting Mgt.

CORPORATE MANAGEMENT
11 President, Owner/Partner, General Mgt.
12 Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
51 Sales & Mktg. Management
70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT
80 Educator, Journalists, Librarians, Students
90 Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep
App. Development Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No

COMPUTERWORLD

E4418-3

Recyclable Paper

Fill it out. Fax it in. Save $8.

FAX NO. 508-626-2705

Yes, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $39.95* per year - a savings of $8.00 off the basic subscription price.

First Name MI Last Name

Title Company

Address City State Zip

Address Shown ❑ Home ❑ Business ❑ New ❑ Renew Basic Rate $48 per year

* U.S. Only. Canada $95, Mexico, Central/South America $150, Europe $295, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the questions below to qualify for this special rate.

1. BUSINESS/INDUSTRY (Circle one)
10 Manufacturer (other than computer)
20 Finance/Insurance/Real Estate
30 Medical/Law/Education
40 Wholesale/Retail/Trade
50 Business Service (except DP)
60 Government - State/Federal/Local
65 Communications Systems/Public Utilities/ Transportation
70 Mining/Construction/Petroleum/Refining/Agric.
80 Manufacturer of Computers, Computer-Related Systems or Peripherals
85 Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90 Computer/Peripheral Dealer/Dist./ Retailer
95 Other_____ (Please Specify)

2. TITLE/FUNCTION (Circle one)
IS/MIS/DP MANAGEMENT
19 Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21 Dir./Mgr. MIS Services, Information Center
22 Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr. /PC Mgr., Tech Planning, Admin Svs.
23 Dir./Mgr. Sys. Development, Sys. Architecture
31 Programming Management, Software Developers
41 Engineering, Scientific, R&D, Tech. Mgt.
60 Sys. Integrators/VARs/Consulting Mgt.

CORPORATE MANAGEMENT
11 President, Owner/Partner, General Mgr.
12 Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
51 Sales & Mktg. Management
70 Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT
80 Educator, Journalists, Librarians, Students
90 Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep
App. Development Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No

COMPUTERWORLD

E4418-3

Recyclable Paper

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD
P O BOX 2044
MARION OHIO 43306-2144

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD
P O BOX 2044
MARION OHIO 43306-2144

Get the Best Seats

to See the World's Best Windows Solutions.

The Place to Be, the People to See.

You'll be impressed by the incredible Windows-based solutions being shown at the Windows World Open finals in Atlanta, May 23–27, 1994. Each of the 24 finalists listed below has created applications that wowed the judges.

FINANCE
The Bank of New York
Price Waterhouse
Thompson Financial Services

GOVERNMENT / PUBLIC ADMINISTRATION
American Student Assistance
Duke University Medical Center
Fund for the City of New York & OPT NYCBOE

HEALTHCARE / SERVICES
Information Management Services
Molly Maid
Shriners Hospitals for Crippled Children

INSURANCE / REAL ESTATE
PHH Technology Services
Tokio Marine Management Inc
ABASIS, S.A. de C.V.

MANUFACTURING
Eastman Kodak
Midmark Corporation
Westt Inc

OTHER
J.L. S[illegible] A
UCLA Sch[illegible] of Medicine
Nat[illegible] Broadcasting Company

TRANSPORTATION / COMMUNICATIONS / UTILITIES
AT&T Global Business Communications Systems
South Coast Air Quality Management District
The Massachusetts District

WHOLESALE / RETAIL / DISTRIBUTION
Man SofCo
Marvin Windows & Doors
R.R. Donnelley & Sons Company

Come to Windows™ World for an enlightening look at this year's award-winning custom solutions.

The third annual Windows World Open, Computerworld's Custom Application Contest, promises to be the best ever. It's your chance to meet face-to-face with the hottest developers in Information Systems. And see how the finalists' applications answered real business needs within their organizations by using Windows technology.

Don't Miss Judgment Day at Windows World.

See how this year's 24 finalists pushed the envelope in developing innovative custom business solutions with Microsoft® Windows™. Then watch as Bill Gates opens the envelope and announces the eight winners during the awards ceremony.

Bill Gates Announces Winners

Windows World Open Awards Ceremony
Georgia World Congress Center
Thomas B. Murphy Ballroom
Tuesday, May 24, 3:30 P.M.

WINDOWS WORLD OPEN
COMPUTERWORLD'S CUSTOM APPLICATION CONTEST

CALL NOW FOR YOUR TICKETS TO THE CEREMONY

1-800-829-4143 or 206-443-3329

Windows World Open is sponsored by: COMPUTERWORLD Microsoft WINDOWS WORLD

and co-sponsored by: AT&T Global Information Solutions FORTUNE Borland COGNOS WALL

Windows, Windows World and the Windows logo are trademarks of Microsoft Corporation. Windows World and the Windows logo are used by INTERFACE GROUP–NEVADA, Inc. under license from Microsoft.

For upcoming seminars, call 1-800-989-3773, ext. 165.

Progress introduces application development software with significantly more depth.

© 1993 Progress is a registered trademark of Progress Software Corporation

PROGRESS VERSION 7.
MISSION-CRITICAL MEETS
CLIENT/SERVER.

These days, everybody and their brother is offering client/server development software with GUI capabilities. GUI, that is, and not much else. Now, introducing PROGRESS® Version 7. The client/server development software with an unprecedented mix of graphical capability and depth. And the only GUI development tools powerful enough to take you from pilot projects to even the toughest mission-critical, client/server applications.

Version 7 also lets you create GUI or character-based applications for client/server, host-terminal or mixed configurations. And the applications are portable across a wide range of databases, network environments, operating systems and hardware platforms. Plus, your applications are scalable, portable and reconfigurable without recoding. The result? Increased flexibility to help simplify the move to client/server. And, an investment in applications and systems that stays protected over time. So call the number below and witness Version 7 in action. At which point, we'll promptly bury the competition.

Call 1-800-989-3773 extension 165 to qualify for a specially-priced Version 7 test drive.

PROGRESS
SOFTWARE

Rush is on for plug-and-play leadership

Common code base will let users choose modules to run applications over varied operating systems

By William Brandel

PC software vendors are rushing to implement componentized, building block architectures that should help users port code more quickly and run applications across different types of desktop machines.

While plug and play has been around the PC hardware industry for a while, the notion of breaking up software applications into components and gluing them back together using object-oriented tools is relatively new to the PC software industry.

Users welcomed these efforts. "We definitely will look at these next-level applications, but of course this all depends on how well the vendors implement these frameworks. Being able to pick and choose pieces of an application makes sense for the users," said Lee Allen, manager of decision-support systems at Schering-Plough Corp. in Union, N.J.

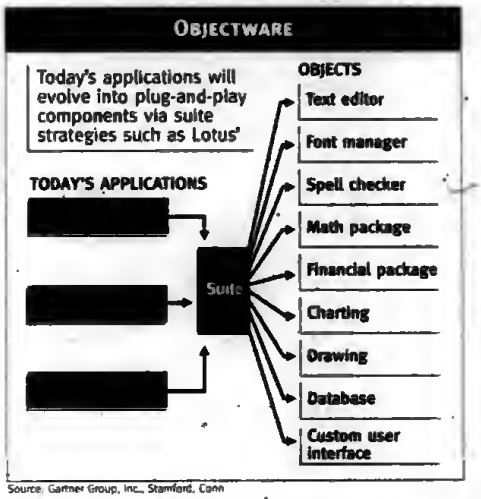
The pending arrival of new object-oriented software and tools — for example, Component Integration Laboratories' OpenDoc and Microsoft Corp.'s Object Linking and Embedding (OLE) 2.0 and Windows 4.0 (also known as Chicago) — will help vendors achieve this goal. Nearly all major software developers, including Lotus Development Corp., Microsoft and WordPerfect Corp., have incorporated this idea or plan to do so soon.

Vendor offerings

"All the major software vendors will be offering plug-and-play applications by the end of this year," said Bob Flanagan, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H. To do so, vendors will adopt a common, portable code base that will be included in upcoming versions of their software application suites.

This common code base for suites such as Microsoft's Office or Lotus' SmartSuite will become the engine for the suites' application execution, Flanagan said. The common code will sit atop a layer of middleware, which will enable this engine to run over different operating systems.

This interpretation of plug and play is already in place in WordPerfect's Office messaging system. By using the same code base, the application runs over Windows, DOS and Unix, WordPerfect officials said.



Source: Gartner Group, Inc., Stamford, Conn.

Lotus recently unveiled a new architecture for its next-generation applications. By pooling all the base application functions into a common code base, SmartSuite programs such as Lotus' 1-2-3 spreadsheet or its Ami Pro word processor can be plugged in as feature sets for the user, said Alex Morrow, general manager of cross-platform architecture at Lotus.

"Think of it as an iceberg with the user seeing only the top 20% of the triangle," Morrow said. "But underneath, the application code has been chopped into little pieces. Those pieces are objects, the remaining 80% of the application that make up the common code."

More features

Lotus' common code set, which will roll out in different applications, will be based on a 32-bit architecture and will take advantage of features like multithreading, multitasking and preemption.

Because the lower-level code in Microsoft's Windows 4.0 will include these same attributes, Lotus developers only have to build extensions into their OS/2 common code for it to run over Windows 4.0, Lotus officials said.

Using this 32-bit, cross-platform code base, Lotus said it will deliver the same feature set found in OS/2 and Windows 4.0 and still offer a consistent user interface and file formats across the different platforms.

Microsoft has already made its move toward common application features and user interface in its Office suite, said Robbie Bach, program director at Microsoft. Using Microsoft's Visual Basic macro language or OLE, application components such as spreadsheet cells can be called up by another application, such as Microsoft Word, Bach said.

These new architectures will let users customize vendors' applications and integrate their own in-house-built components, or those from other vendors, into the applications. While not many general applications on the market support OLE 2.0, Chicago or OpenDoc, WordPerfect said it will deliver OLE 2.0-compliant applications beginning this summer.

Client/server tools

Intersolv expands into desktop arena with Q+E purchase

By Melinda-Carol Ballou

■ Client/server tools vendor Intersolv, Inc. extended the reach of its product line into the desktop reporting and database access arena late last month when it acquired Q+E Software.

Under terms of the agreement, Intersolv purchased Q+E Software for about $36 million, comprising $5.3 million in cash and 2.6 million shares of Intersolv stock.

Corporate information systems managers familiar with products from both companies applauded the merger.

"The advantage I see here is that of synergy between the two. This will make Intersolv into a $100 million company and give them more market presence on the desktop and will put significant backing behind Q+E" at the same time, said Lee Scalzott, vice president of applications software development at Cable & Wireless, Inc., a Vienna, Va., telecommunications company.

"It's a win-win situation for both companies," said Britt Mayo, director of information technology at Pennzoil Co., a Houston-based petrochemical company and a user of Q+E Software products. "It makes Intersolv a stronger company, gives them a broader range of tools and gives Q+E leverage with financial and other resources."

Reorganizing efforts

As a result of the agreement, product development at Q+E Software will remain a separate division under Intersolv, but the sales and marketing arm of the company will merge with Intersolv's.

The Q+E product line will also be integrated with Intersolv tools, such as PVCS configuration management tools and APS and Excelerator II application development products, to offer a similar look and feel across the entire product line.

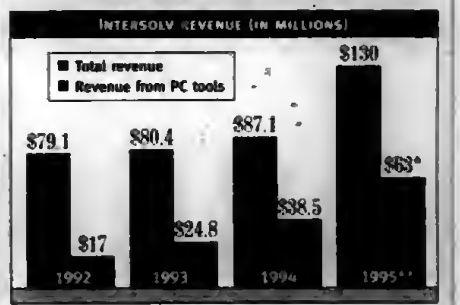
Both Mayo and Scalzott said they are interested in checking out the combined products as they become available over the next 12 to 18 months.

Distribution for Q+E Software's tools has been handled largely through OEMs. For instance, Micro-

Intersolv, *page 87*

Gaining ground

Intersolv is becoming more multifaceted with the acquisition of Q+E Software. The company is likely to receive nearly half its revenue from PC tools by 1995, compared with its traditional base of high-end IS tools.



*Includes Q+E Software tools in addition to Intersolv's PVCS. (Earlier PC tools figures include only PVCS.) **Projected

Source: Volpe, Welty & Co., San Francisco

Shadow Direct integrates DB2 data

By Thomas Hoffman

Neon Systems, Inc., a Houston-based middleware developer, recently introduced a package that integrates IBM DB2 data with desktop packages such as Lotus Development Corp.'s 1-2-3, Powersoft Corp.'s PowerBuilder and Microsoft Corp.'s Excel.

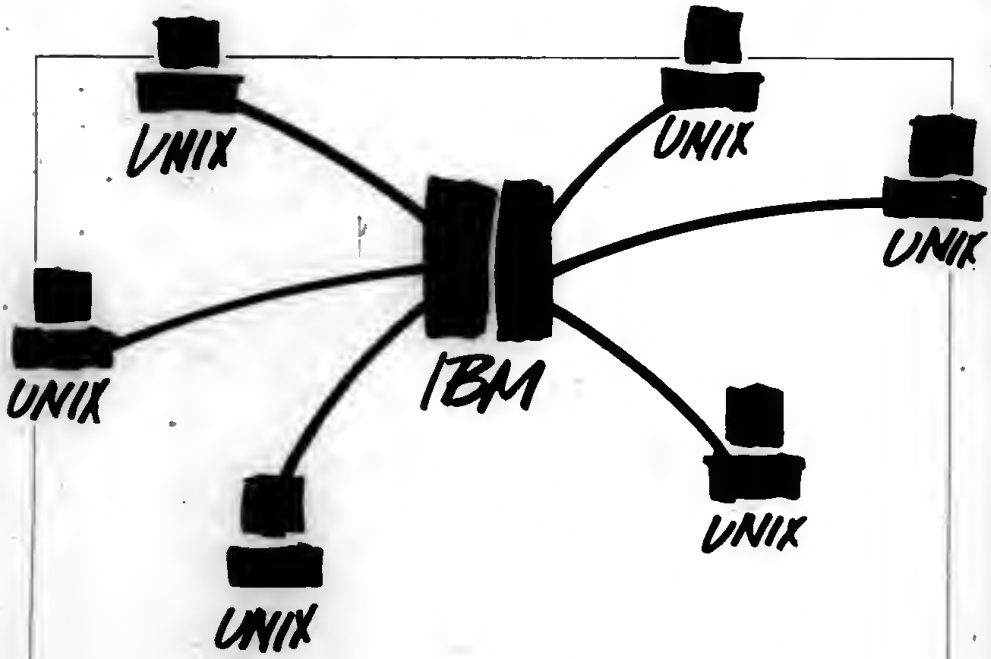
The package, called Shadow Direct, is compliant with Microsoft's Open Database Connectivity (ODBC) application programming interface. With Shadow Direct, a gateway product is oot oeeded to integrate DB2 data with clieot desktop applicatioos because the package resides on both the ODBC driver and an IBM MVS host component, according to Peter Schaeffer, Neoo's director of technology.

Shadow Direct provides desktop users with direct access to a mainframe using a TCP/IP or LU6.2 link.

Texaco Corp. in Tulsa, Okla., a Shadow Direct user since December, has been using the software to download DB2 data to a PowerBuilder-based natural gas scheduling system, said Ron Garrison, an information systems supervisor at the petroleum firm.

Garrisoo said he was particularly impressed with Shadow Direct's Dynamic SQL capabilities. "This product has worked out very well for us," he said.

Shadow Direct, which supports all current releases of DB2, VTAM and TCP/IP, is available now. Pricing ranges from $10,000 to $50,000, depending on host processor size.



If only it were this simple.

Linking remote UNIX systems to IBM hosts can be a challenge. There are many issues to consider.

- Do you have a traditional SNA/SDLC network, or do you use other technologies such as TCP/IP, APPN, Token-Ring, X.25, or satellite communications?
- Do your UNIX systems serve or link to LANs? Are there SNA gateways for these LANs?
- Do you process interactively (3270, 5250), in batch (RJE), or both?
- Do you use program interfaces such as HLLAPI, CPI-C/APPC/LU6.2, and LUA/LU0?
- How do you manage your network? How do you distribute programs, files, and data to your remote UNIX systems?
- How will your network evolve in the future? Are you moving to client-server?

CLEO can help you sort it all out. We're experts in UNIX-to-IBM connectivity. Our products have been proven in over 100,000 worldwide installations.

Our free "Solutions Guide" clearly and concisely explains your major UNIX-to-IBM connectivity alternatives. Easy-to-understand configuration diagrams help you match the right solutions to your needs.

To order your copy, call 1-800-233-2536. Or mail or fax us this information.

Please send me your free booklet

Name

Title

Organization

Address

City, State, Zip

Phone

Mail to: CLEO Communications, 3796 Plaza Drive, Ann Arbor, MI 48108. *Fax:* 313/662-1965

Available worldwide! In Europe, call Interface Systems International in Slough England at ++44-0"753-811868 (fax ++44-0"753-811666).

CLEO
CLEO Communications
A Division of Interface Systems,Inc.

SCO

See us at Networld + Interop 94, Las Vegas, May 4-6, booth #11439.

Briefs

OMG to map IDL

The Object Management Group (OMG) recently announced a request for information for common facilities and a request for proposals for Smalltalk Language Mapping for the group's Interface Definition Language (IDL). The original IDL was offered with mappings to C, and the OMG is currently specifying mappings for C++. The common facilities will provide document architecture services such as those offered by Microsoft Corp.'s Object Linking and Embedding.

Upgrade for AutoTester

AutoTester, Inc. announced a new version of its AutoTester for Windows 2.0 software testing tool. It will offer special drivers for automated testing of applications created with Powersoft Corp.'s PowerBuilder. The tool recognizes standard Windows objects and specialized PowerBuilder objects, such as the PowerBuilder Data Windows, company officials said. A separate collaboration with Gupta Corp. will let developers test Gupta SQL/Windows applications with AutoTester.

MCI picks Versant

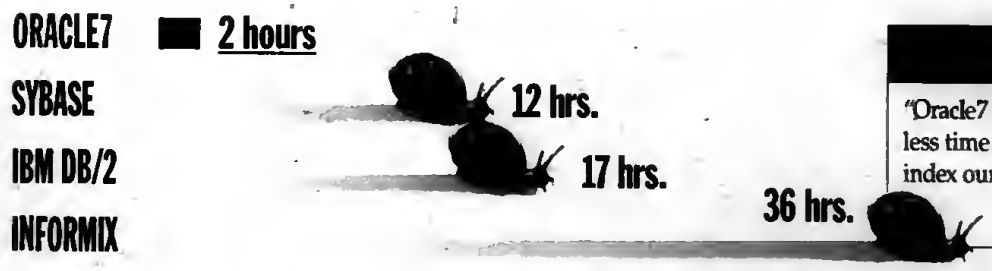
Versant Object Technology Corp. announced that MCI Communications Corp. elected Versant's Object Database Management System for an international network management application. An MCI team based in Colorado Springs is developing the application, which will be deployed at MCI's international network management center to handle functions such as event reporting.

Business Object for HP

Hewlett-Packard Co. has selected Business Objects, Inc.'s Business Object software as an information access component for HP's OpenWarehouse program, according to Business Objects officials. OpenWarehouse integrates third-party applications to create a data warehouse. Business Objects is an information access, analysis and reporting tool.

Gentlemen, start your snails.

PC Magazine independently defined and ran a battery of real-world performance tests to compare database server software. PC Magazine states, "Oracle7 was the hands down winner on our performance tests, outperforming the others by a wide margin."



LOAD AND INDEX

"Oracle7 finished the entire test suite in less time than most took just to load and index our data."

PC Magazine

AD HOC QUERY

"Oracle7 completed the queries in a blistering 47 minutes, three times as fast as...the other products."

PC Magazine

CONCURRENT RANDOM WRITE

"Even with the many new features that were added, we found Oracle7 to be exceptionally stable"

PC Magazine

CONCURRENT RANDOM READ

"Oracle7's read-consistent model and record level locking helped it breeze through the test."

PC Magazine

Just to be fair, here's what PC Magazine had to say about the other guys:

Informix OnLine *"Only after days and days of repeated crashes were we able to obtain a full set of results."*

Ingres Server *"...we would not recommend it because of the showstopping multi-user bug we encountered."*

Gupta SQLBase *"...took an unthinkable 60 hours to load the tables and then crashed on the index builds..."*

For your copy of the complete PC Magazine article, including test results call 1-800-633-1071 Ext.8129.

ORACLE

© 1993 Oracle Corporation

BZW © Digital Equipment Corporation 1994. The DIGITAL logo, Alpha AXP and Alpha are trademarks of Digital Equipment Corporation.

"We wanted a global partner to help us set world records in client/server."

"Digital answered the call with Alpha AXP."

Our clients include many of the largest corporations in the world. As a global leader in the development of software that enables a company to share and manage information throughout their entire enterprise, we at SAP designed our R/3 client/server software to take full advantage of the most advanced technology available in the world.

Klaus Besier, CEO, SAP America, Teams Up With Digital's Alpha AXP.

By teaming up with Digital and their Alpha AXP architecture, we got the high performance and breakthrough speed we were looking for. That means you can sit at an Alpha AXP workstation in New York and use R/3 to access sales figures in London and inventory in Hong Kong — to give answers in an instant to your customer in Los Angeles about when to expect delivery. In other words, we give you fully integrated, real-time, on-line client/server solutions."

"...World-Class Speed"

"Simply stated, we wanted Digital's Alpha AXP because software like ours demands world-class speed. SAP's R/3 System thrives on the horsepower Alpha delivers. Allowing our clients to effortlessly manage anything and everything from manufacturing, sales and distribution functions to financial and human resources. In virtually the blink of an eye. All over the world.

"It's a very powerful partnership. Two global companies that can put you on the cutting edge of client/server technology. By building on our vision, the people at Digital helped us create real solutions for our customers. Starting with outstanding consulting services that range from planning to total application integration and data migration for legacy systems — to overall project management."

"...The Best Of Both Worlds"

"Together, SAP and Digital are now offering the best of both of our worlds. Alpha AXP with R/3. But the big winners are our customers. They get fully integrated client/server solutions that operate at the speed of Alpha. And that's why I called Digital."

Alpha AXP gave SAP the power to be its best. If you'd like to hear how we can do the same for you, it's time you called Digital.

CALL 1-800 DIGITAL

To Work digital

AT THIS YEAR'S TRADE SHOW, WE'LL BE NETWORKING HARDER THAN ANYONE.

CHOSEN FOR THE 1994 NETWORLD + INTEROP NETWORK.

This year, while a lot of people walk around and enjoy the show, we'll be working it hard. Our servers are an integral part of the network running demos. So, all week long, they'll be busy protecting data, preventing crashes and keeping info flowing to booths all across the hall floor. While you're at the show, visit our booth, #1202. Our servers will be pretty busy. But we'll have plenty of time to chat.

NETWORLD + INTEROP
interopNet CONTRIBUTOR LAS VEGAS

yes NetWare Tested and Approved

DELL™

For Advanced Systems Information, Call

800-433-7830

HOURS MON-FRI 7AM-9PM CT SAT 10AM-6PM CT SUN 12PM-5PM CT
CANADA, 800-668-3021 MEXICO CITY, 228-7811 KEYCODE #11HK3

Novell and NetWare are registered trademarks of Novell, Inc. Dell disclaims proprietary interest in the marks and names of others. ©1994 Dell Computer Corporation

[redacted]

Rogue Wave Software, Inc. has announced Heap.b++, a memory management library module.

According to the Corvallis, Ore., company, Heap.b++ can make C and C++ programs run faster and use less memory by relinking the program.

Heap.h++ features a high-level Heap object interface that allows user control of memory policy, adaptability to any Unix system and the return of unused memory to the operating system whenever possible.

Heap.h++ costs $995.

▶ *Rogue Wave Software*
(503) 754-3010

ParcPlace Systems, Inc. has introduced ObjectBuilder 2.5, a graphical user interface builder that allows C++ developers to encapsulate off-the-shelf, non-ObjectBnilder-based Xt building blocks and nse them to construct a user interface for C++ based applications.

According to the Sunnyvale, Calif., company, ObjectBuilder 2.5 includes additional palettes, customizable and extensible editors and support for Motif 1.2.

The product is available for Sun Microsystems, Inc.'s SPARC systems running SunOS 4.1.x or Solaris 2.x, Hewlett-Packard Co.'s Series 9000/700-800 with HP/UX 9.x and IBM RS/6000 under AIX 3.x.

A single concurrent user license costs $4,500, and five-pack concurrent licenses are available for $18,750.

▶ *ParcPlace Systems*
(408) 481-9090

Sheridan Software Systems, Inc. has introduced Designer Widgets, a set of custom controls for Microsoft Corp.'s Visual Basic.

According to the Melville, N.Y., company, the product includes a Dockable Toolbar control that lets users create floating tool bars of buttons that the user can "dock" or attach to the top, sides or bottom of a Multiple Document interface form. When not docked, the tool bar can be reshaped or resized. Users can also create index tabs that let them design dialogs using the index tab metaphor to group collections of related options.

A FormFX control customizes forms by manipulating captions and borders. Users can include multiline text and pictures, and they can change the height, adjust the fonts and alignment or add a three-dimensional look.

Designer Widgets costs $129.

▶ *Sheridan Software Systems*
(516) 753-0985

Intersolv

CONTINUED FROM PAGE 81

soft Corp. shipped 4 million copies of Q+E Software's query product with its Excel spreadsheet during the past few years, according to Kevin Burns, president and chief executive officer at Intersolv.

Q+E had considered going public to gain revenue to strengthen distribution capabilities and focus resources on research and development. But company officials ultimately chose to be acquired instead in order to expand distribution opportunities.

Who decides?

"Purchasing decisions are moving from individual departments up to information systems professionals as IS becomes more serious about client/server, and Q+E has had no distribution channels targeting those IS groups," said Ed Acly, an analyst at international Data Corp., a Framingham, Mass., consulting firm.

"This lets them tap into what Intersolv has and to sell to npscale developers," he said.

Other analysts agreed.

After this acquisition, intersolv "will have a larger portion of revenue related to the PC tools business compared with their traditional MIS business," said Paul Bloom, an analyst at Volpe, Welty & Co., a San Francisco investment banking firm (see chart, page 81).

"They're trying to tap into all the bot markets because the world is changing. But this is an intelligent acquisition and a good addition for them since it doesn't compete with other major vendors," Bloom added.

IT'S NOT HOW MUCH YOU READ.

You can read a knee-high stack of computer magazines each month and still not find the depth and breadth of news and information you'll discover each week in the pages of *Computerworld*.

As the only weekly newspaper for IS professionals, *Computerworld* is filled with up-to-the-minute articles on topics ranging from products and people to trends and technology. We cover it all — PC's, workstations, mainframes, client/server computing, networking, communications, open systems, languages, industry news, and more.

It's everything you need to know to get an edge on the competition.

That's why over 139,000 IS professionals pay to subscribe to *Computerworld* every week. Shouldn't you.

IT'S WHAT YOU READ.

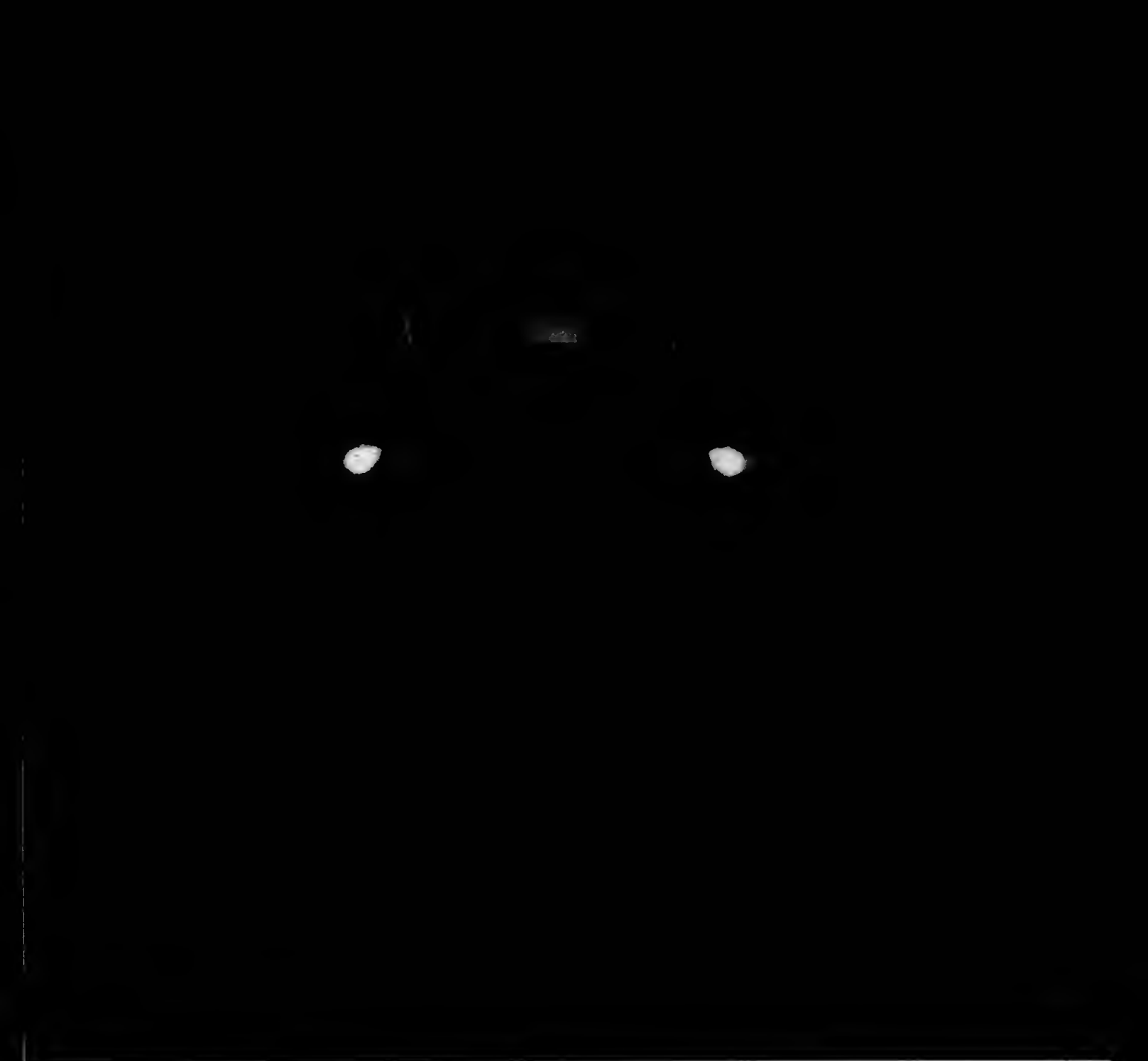
Order *Computerworld* and you'll receive 51 information-packed issues. Plus, you'll receive our special bonus publication, *The Premier 100*, an annual profile of the leading companies using information systems technology.

Call us toll-free at **1-800-343-6474**. Or use the postage-paid subscription card bound into this issue. And get your own copy of *Computerworld*.

Then you can spend less time reading about the world of information systems. And more time conquering it.

The Newspaper of IS

How Does American Airlines Manage A Network That Handles 500,000 Reservations Every Day?



THEY FLY WITH NORTHERN TELECOM.

Managing over 250,000 terminals in 70 countries is no easy job. That's why American Airlines came to Northern Telecom to help build one of the largest and most reliable private networks in the world. With the high quality and dependable performance of Magellan enterprise networking solutions, American Airlines provides the same excellent service on the ground as their customers receive in the air. To see how Magellan networks can help your company take off, call 1-800-NORTHERN (press 1 and ask for extension 601). Northern Telecom. Discovering and delivering the best solutions in voice, video & data communications systems worldwide.

nt northern telecom

Magellan is a trademark of Northern Telecom
© 1994 Northern Telecom

The hit the road jack.

Now there's a great new way to live off the LAN. Whether you're heading out of town or just heading home, LAN Distance lets you easily connect to your office network from your Windows™ or OS/2® remote PC.

Use LAN Distance to dial into the LAN and do everything you could do if you were at the office. It's your network node on the road. An in-house network in *your* house.

With hostlike security features, the integrity of your LAN resources is rock solid. LAN Distance even filters and directs WAN traffic to minimize gridlock, so your road node can really move.

All you need is the modem—LAN Distance is a software-only solution. And since it's network operating system independent, it works with IBM LAN Server, Novell® NetWare,® Artisoft® LANtastic® and Banyan® VINES.

For more information, call 1 800 3-IBM-OS2. In Canada, call 1 800 465-7999.

Shorten the distance between you and your LAN—make the LAN Distance call.

How they compare:	IBM LAN Distance	DCA Remote LAN Node	Shiva LANRover	Novell NetWare Connect
Connectivity Options				
Remote to LAN	Yes	Yes	Yes	Yes
Remote to Remote	Yes	No	No	No
LAN to Remote	Yes	No	No	Yes
LAN to LAN	Yes	No	No	Yes
Remote Connectivity Sync, ISDN, X.25 (In addition to ASYNC)	Yes	No	No	Yes
LAN Application Interfaces NetBIOS, NetBEUI, 802.2 (In addition to IP and IPX)	Yes	Yes	Yes	No
Security WS Addr., Sec. Admin., Logon Policies, Logon Day/Time (In addition to User ID, Password and Callback)	Yes	No	No	No

And the next time you hit the road, it'll be like you never left.

We're in the business of connecting yours.

IBM®

This ad was created by UNTAS and got to the publication on time using DOS. Windows and OS/2 programs running on OS/2. IBM and OS/2 are registered trademarks of International Business Machines Corporation. Windows is a trademark of Microsoft Corp. All other products are trademarks or registered trademarks of their respective companies. © 1994 IBM Corp.

MICHAEL ABRAMSON

Bill Murray *never says, "I'm from corporate, and I'm here to help.' They'd never believe me."*

POLITICAL MANEUVERS

ALL technology is political, and the key to a successful campaign is winning allies in influential places

BY Bill Murray knows the secret of any successful political campaign — target your supporters carefully, get out and meet the voters face to face and speak to them in simple terms.

So when Murray wanted to sell the merits of a single enterprisewide communications system for the *Chicago Tribune*-owned television and radio stations, he made a point of sitting down with the top brass at each station one by one.

The new system would track how many times each episode of a TV series has aired and thereby how much the station could charge for commercial time. It would reach each and every local workstation via a LAN.

To explain his vision to each general manager, Murray reaches for his colored markers and the nearest napkin. A few minutes later he reduces plans for the complex network to a few colored lines and circles. Response is quick and favorable.

It's an unusual approach for selling the business merits of a complex information system, but Murray knows he has only a few minutes to win the voters' trust and support, and the simple approach is often the best.

Selling strategic IS projects such as this one is a big part of the chief information officer's job. It's also very tricky. To do it successfully, you need technology allies in the executive suite and in the user ranks.

As director of information services at Tribune Broadcasting Corp., Murray must know how to win those allies and sell his plan to highly skeptical and fiercely independent general managers. But ask Murray how he campaigns, and he'll first tell you how he doesn't.

"I never go in and say, 'I'm from corporate, and I'm here to help.' They'd never believe me," he says.

Instead, Murray draws his pictures. He first illustrates their current system architecture of six stand-alone applications. He then draws a single line to represent the same applications, plus a new

Maneuvers, *page 92*

Maneuvers

CONTINUED FROM PAGE 91

program management system he wants the TV stations to implement.

After that, Murray offers to pay for most but not all of the project costs.

"When they see that on paper, they think it's almost too good to be true," says Murray, whose infrastructure-building strategy is to seed LAN-based systems where now there are no LANs.

"What we do is sell stations on the idea that IS will shoulder a lot of the up-front costs," he explains. What IS receives in return, he says, is a "tremendous start on a sophisticated enterprisewide network that adheres to company standards" and buy-in from previously recalcitrant business divisions.

Choosing a target

But who make the best campaign prospects, and how should they he approached?

Whether a particular project or advanced technology in general flies or falters almost always depends on the answers to those questions. As with any campaign, there are certain political ground rules. Three of the most important, managers say, are: Keep your message short and simple, know you'll need to compromise periodically, and choose one individual to act as the point person on each project.

"When one person becomes identified with a project, listeners develop an emotional attachment to that person," says John Glaser, vice president of IS at Brigham and Women's Hospital in Boston. He advises the point person to develop "a short but exciting sound-bite mentality message."

One of the easiest ways to recruit allies in management ranks is to find people — preferably bosses and managers — who will directly and instantaneously benefit from the technology project under consideration, says former CIO Jim Fitchett.

In his six years in the top information technology post at Harvard Medical School, Fitchett, now an independent consultant, installed a campuswide fiber network that tied together administrators, academic researchers and clinicians at 19 medical organizations.

He also switched 3,100 phones to an Integrated Services Digital Network and brought up a campuswide electronic-mail system and an on-line system for searching the National Library of Medicine's database of 6,000 journals. So Fitchett speaks from experience when he insists that "whether a potential champion for a project is a technophile or technophobe is irrelevant."

What is important, he says, is the stature of the champion. To sell the school's administration on E-mail, for instance, Fitchett set up a small pilot project whose users included high-level medical school executives and a geographically dispersed group of well-regarded researchers who were using a limited mainframe-based E-mail system. His two criteria for choosing pilot project participants were very pragmatic.

"I wanted executives with a lot of influence over the rest of the community. I also picked people I thought would be most resistant to change because if the pilot worked, I would have eliminated the strongest opposition," he says.

True believers

Fitchett set up his hand-picked group of users with Lotus Development Corp.'s CC:Mail, and in a very short time, "they became dependent on the system and began proselytizing its benefits," he says.

This was done largely in an informal fashion. For instance, one colleague might praise the ability to attach binary files to messages, and from there, word would spread, Fitchett says.

To get a handle on precisely who key decision-makers are as well as who influences their thinking, Glaser says a CIO must "constantly do political reconnaissance."

Fundamentally, this boils down to "good listening. You slowly develop an appreciation for who matters and learn to distinguish between white noise and real noise. It's something that's almost visceral," he says.

To win support for major projects such as the massive architectural overhaul now in its final stages at Brigham and Women's, "you also have to have a deeply rooted vision of your own and be able to explain exactly why the current system can't fulfill that vision," Glaser says.

Major revamp

In 1989, Glaser's vision entailed nothing short of ripping out all host/terminal-based hardware housing all 65 administrative and clinical applications and then reinstalling the same applications on a system of networked PCs. The new networked system would offer state-of-the-art health care services, such as digitized X-ray transmissions.

"The idea was that from a pure business perspective this would increase revenues because we'd get increased referrals to the radiology department," Glaser says.

From an IS perspective, "What we were talking about was like replacing the rug beneath a cocktail party and having nobody notice. It was a very serious major big deal, and that's the way we sold it," Glaser says. "We said from the beginning that it would take three to five years and cost millions of dollars."

Management's first reaction was disbelief, which Glaser said he had anticipated.

> **The operative word is win rather than decree. Just as outside organizations can sway buyers with discounts and other favorable contractual terms, most CIOs have a number of inducements they too can use to sign over prospective project champions.**
>
> PAUL OUELLETTE, PRINCIPAL AT OUELLETTE & ASSOCIATES AND AUTHOR OF *HOW TO MARKET THE IS DEPARTMENT INTERNALLY*

"Remember, this is 1989, and we were talking about networked PCs," he says. So Glaser returned to management with an 18-month plan under which seven external review groups would test the feasibility and risks of the network plan.

Some of the review groups, such as teams from IBM and Digital Equipment Corp., were "opportunistic," Glaser says. That is, if the project proved feasible, both companies had a shot at a big hardware contract.

In exchange for allowing them to review the hospital's IS plans, Glaser required absolute candor on their part. The other review groups, he says, provided the various technical, medical and business perspectives the proposed project required.

"The logic behind the reviews was to test the whole idea because the stakes were so high," he says.

Up and running

For two years the proposal held up, and the hospital moved its accounts payable system to networked PCs in early 1991. Four months after that, it moved another administrative system. In December of the same year, it migrated its first clinical application, a laboratory system physicians used to look up test results.

It all worked, but Glaser is careful to deflect any kudos, which is another important part of his ongoing IS marketing strategy. The IS department, he says, is just doing its job, which is to support the hospital, its patients and staff.

"The same way a good teacher never calls herself a good teacher in front of the class, we emphasize that it's the hospital and doctors who put up with IS," Glaser says.

Glaser says he believes this works to further increase IS credibility in the long run.

Most IS departments would do well to heed Glaser's advice, according to Paul Ouellette, principal at Ouellette & Associates Consulting, Inc. and author of *How To Market The IS Department Internally*. The reason is that most have a credibility problem that stems from a long tradition of dictating solutions rather than influencing technology choices.

Maneuvers, *page 94*

Waging the winning campaign

To be successful at selling an IS project:

CHOOSE CHAMPIONS for your cause who are respected and influential.

DO RECONNAISSANCE constantly to stay informed on whose opinions matter.

TARGET BENEFACTORS — preferably in high places — who will gain from your project.

SHARE YOUR VISION and show why it can't be achieved without your project.

MAKE MESSAGES short and simple.

OFFER INDUCEMENTS to win others to your cause.

INVOLVE USERS in the development process to gain their support.

PICK POINT PEOPLE with whom users can identify.

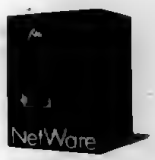
COMPROMISE periodically to keep users happy.

How much work could a workgroup do if a workgroup could work grouped?

It may be the riddle of the computer age, but now there's a new product with the answer you've been waiting for.

Introducing Personal NetWare. It's a "personal" network you can add to NetWare that allows you to directly access the resources and people in your workgroup running DOS or MS Windows. You can capitalize on individual desktop resources like laser printers or CD-ROMs by sharing them among the people using Personal NetWare.

And Personal NetWare is easy to manage because it includes desktop SNMP management. Plus, Personal NetWare offers you the same security you've come to rely on in NetWare.



New Personal NetWare. Bringing workgroups closer together.

New Personal NetWare works with what you've already got to create a computing environment that helps your workgroups work better together. If that sounds good to you, call 1-800-554-4446 for a free demo disk or, if you prefer, get the facts by fax at 1-800-NETWARE, and request document #9010. You'll be surprised at how much work workgroups can do once they're working grouped.

yes Personal NetWare

NOVELL. The Past, Present, and Future of Network Computing.

Maneuvers

CONTINUED FROM PAGE 92

"Now IS must make a big cultural change," Ouellette says. "It has to behave in the same manner that any outside competitor coming in to win business would behave."

And here, Ouellette emphasizes, the operative word is win rather than decree. Just as outside organizations can sway buyers with discounts and other favorable contractual terms, most CIOs have a number of inducements they can use to win over prospective project champions.

Among the most powerful are pure IS-based resources, such as an applications developer devoted to a particular manager's pet project. As part of the technology marketing process, IS managers "have to look at things from a very practical point of view," says Cynthia Beath, an associate professor of management at Southern Methodist University in Dallas who has studied the corporate championing process.

"In return for support, let a project champion deviate from the rules and violate certain standards. Bump them up on the priority list," she tells IS managers.

Brigham and Women's Glaser, for one, says his department responds more rapidly to requests from higher-ups at the hospital, but he draws the line when it comes to standards. "You don't get to violate standards because that will ripple and start an erosion of the architecture."

Putting together a team

On the user side, one of the best ways to gain support is by involving users in the development process, says Alec Pettersen, vice president of IS at Fox Television Stations, Inc. in Los Angeles. Before seeking upper management's approval for a LAN-based sales system, for instance, his department included sales executives in the selection process.

"Building this kind of support in the user community gives you credibility when you go higher up for [financial] support for a project," he says.

One-on-one demonstrations have helped IS general manager Pauline Nornholm gain user buy-in on technology-based projects at Douglas Aircraft Co., a division of McDonnell Douglas Corp. in Long Beach, Calif. By showing users how a proposed client/server-based document management system would work when completed, Nornholm says she had no problem winning user support for the project.

"You can sell new things very easily by showing people how technology will make their jobs easier," Nornholm says.

Selling an idea

Nornholm estimates that between 80% and 90% of her job is selling, and that often includes selling to her own IS organization.

When she assumed her current post three years ago with the idea of distributing systems off of mainframes and making data available directly to end users, one of her first campaign challenges was changing the mind-set of a staff of largely Cobol programmers, who perceived data as the property of IS.

These days, CIOs are mostly selling infrastructure improvements, says Gerald Loev, a former CIO at The Prudential Insurance Company of America and now president of CSC Impact in Newark, N.J., the consulting arm of CSC Index, Inc. that deals with information technology strategy and organization.

Because it's more technology-oriented than business-oriented, infrastructure improvements are "a tough sell because you're selling stuff that business doesn't understand and doesn't see why it needs to be done," Loev says.

He compares it with a mayor trying to sell the voters on infrastructure improvements. They're needed, "but that's not what wins elections," he says.

While their tactics and methods may vary, the one thing on which most IS managers seem to agree is that the job of campaigning never ends.

"Marketing and politics are incredibly important," Glaser says.

"Every day you've got to keep your finger on the pulse because support is like a slowly leaking balloon. You have to constantly check its pressure and keep it inflated," he says. ■

King is a *Computerworld* senior editor, management.

Announcing COMPUTERWORLD on CD

...years of ... ready for searching, analyzing, cross-indexing and competitive analysis.

Here's What You Get When You Subscribe:

- Over four years worth of full text articles from COMPUTERWORLD.
- Selected graphics from each issue showing industry trends, product comparisons and more.
- Articles from COMPUTERWORLD's annual *Premier 100* and *Computer Careers* magazines.
- Detailed information from *Premier 100* – data about IS budgets; profit growth, total scores and company highlights about all the *Premier 100* companies.
- Over five years worth of articles from the *Journal of Information Systems Education*, published by DPMA's Special Interest Group on Education (EDSIG).
- Annual subscription includes four discs updated quarterly.

COMPUTERWORLD on CD Helps You:

- Search comprehensive product and vendor information quickly.
- Follow critical technology trends.
- Analyze top company IS profiles.
- Execute key word searches on any topic in seconds.
- Eliminate mass paper storage.

Easy-To-Use

Our powerful search and retrieval capability will deliver exactly what you are looking for in a matter of seconds. . . it's simple . . . all you need to do is type in either a word or phrase related to your questions.

Plus, COMPUTERWORLD on CD features multi-platform compatibility on PC (DOS and OS/2), Mac, and Windows environments.

Save $100

Become A Charter Subscriber and SAVE $100

Subscribe today and become a charter subscriber for just $295. You save $100 off the regular annual subscription rate of $395.

Don't miss this opportunity to have quick access to the most powerful news source on information systems. Order today by completing and returning the form below. For faster service call. (800) 285-3821. (Outside the U.S. call (508) 879-0006).

What users like about Computerworld on CD:

"It can look up products and company names. . .indispensable."

"...finds product information and client information quickly."

"...full base text, good graphical start for each article."

"Can search across multiple issues and find the thing I'm looking for. Makes life easier."

"The sheer volume of what's in it. Easy access without having to go to a library service."

"It has information not found on Computer Select."

Source: Survey of Computerworld on CD subscribers, May 1993.

COMPUTERWORLD on CD

Yes! Please reserve my Charter Subscription to COMPUTERWORLD on CD and send me my first quarterly disk. I'll pay just $295*, a savings of $100 off the regular annual rate. Send no money now. We'll bill you later.

FIRST NAME LAST NAME

TITLE COMPANY

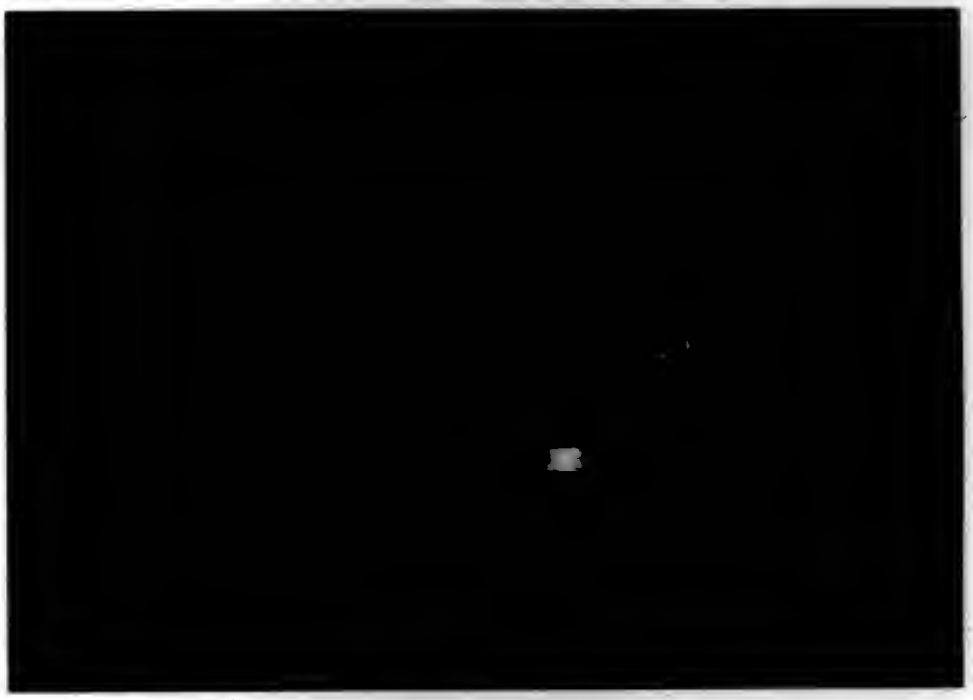
ADDRESS

CITY STATE ZIP

*U.S. Only. To complete your order, mail this form to: Emerging Technology Applications, ATTN: Sales Department, 111 Speen Street, Framingham, MA 01701. For Credit Card orders call: (800) 285-3821

CD/5-2

AT 6:00 P.M., FACED WITH DISTRIBUTING 120 SETS OF SOFTWARE UPDATES ACROSS 3 CITIES, AND TRANSFERRING DAILY SALES REPORTS FROM 320 REMOTE SITES, PAT THOMPSON DID WHAT ANY DEDICATED MANAGER WOULD DO.



HE WENT HOME.

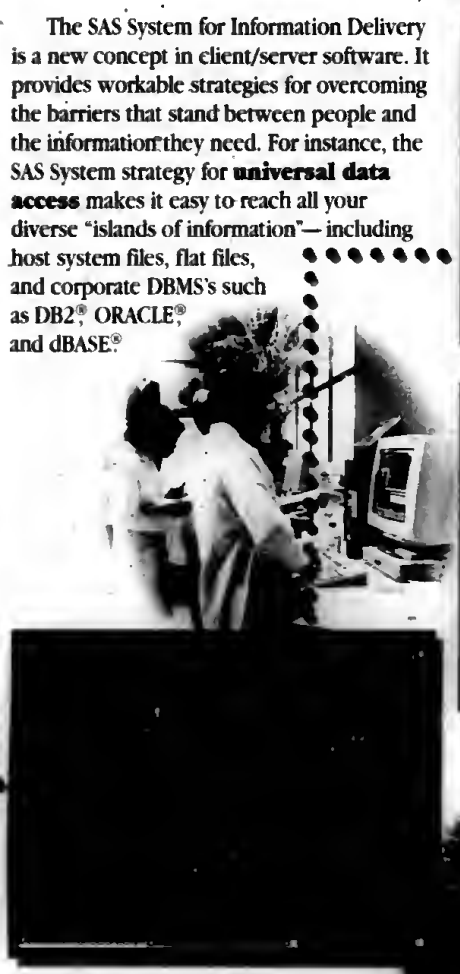
Pat Thompson's company, like over 1,000 others, entrusts the movement of their business-critical data to Legent's XCOM®, MLINK™/ACM and DistribuLink™ software. Because Legent is the leader, with years of experience in providing reliable data transport and software distribution solutions. From MVS and UNIX to OS/2, Windows and DOS. From SNA to Async to TCP/IP. Legent has you covered. And it's all part of XPE, Legent's integrated framework for managing distributed solutions across the enterprise. Moving data and software across your enterprise doesn't have to be a logistical nightmare. Rely on Legent, the leader in data transport and software distribution. Call **1-800-676-LGNT**, extension 336 for more information.

CROSS PLATFORM ENVIRONMENT

LEGENT
THE EXPERTS IN DISTRIBUTED SYSTEMS MANAGEMENT

The Client/Server Solut

The SAS System for Information Delivery is a new concept in client/server software. It provides workable strategies for overcoming the barriers that stand between people and the information they need. For instance, the SAS System strategy for **universal data access** makes it easy to reach all your diverse "islands of information"— including host system files, flat files, and corporate DBMS's such as DB2®, ORACLE®, and dBASE®.



An exclusive MultiVendor Architecture™ is behind the SAS System's strategy for **hardware independence**. Applications run the same way across PCs, workstations, and host systems—making true client/server computing a reality while exploiting the particular strengths of each platform.

Address the needs of users at every level with the SAS System's strategy for **interface versatility**. An EIS interface puts decision makers in command of the facts—when they need them. There's also a task-oriented menu-driven interface for business

The SAS

Enterprise Wide In

ion for EIS and Beyond

analysts... plus object-oriented and full-function programming environments for applications developers.

The SAS System's **applications integration** strategy provides one seamless solution for virtually any application that involves accessing, managing, analyzing, or presenting data. Choose integrated tools for decision support, reporting, financial analysis, market research, project management, quality improvement, and more. All backed by SAS Institute Inc., a vital force in the information

industry with a strong commitment to helping you succeed—and an unrivaled dedication to training, documentation, technical support, and consulting services.

See for yourself how the SAS System of software brings out the best in your hardware and the people who use it. Just give us a call at **919-677-8200** for a free video, plus details about a free software evaluation.

SAS®

SAS Institute Inc.
Phone 919-677-8200
Fax 919-677-8123

SAS is a registered trademark of SAS Institute Inc
Copyright ©1993 by SAS Institute Inc.

® System

formation Delivery

DAFFY FOR Dilbert

"The big risk to business today is what I call destructive agreement. That's where everybody goes along with the plan, but not far enough to make it work. I try to expose what employees are really thinking."

SCOTT ADAMS

BY ROCHELLE GARNER

CARTOONIST SCOTT ADAMS HAS PUT HIS FINGER ON THE PULSE OF WHAT IS EMPLOYEES ARE REALLY THINKING — AND MANAGEMENT HAD BETTER PAY ATTENTION.

Scott Adams is doing what he'd always hoped he would do: Drawing cartoons that puncture pretension and magnify management follies.

Don't know who he is? You should because your staff certainly does. They've papered their cubicles with his "Dilbert" cartoons that, time and again, reveal exactly what they're feeling about you and your company.

Today, Dilbert has outstripped "The Far Side" and "Calvin and Hobbes" as the comic most often littering the workplace. Its quiet subversiveness strikes a resonating chord in underappreciated programmers, systems analysts, engineers and scientists from Boston to Los Angeles.

And Dilbert's eerie ability to showcase dysfunctional corporate cultures has readers around the country convinced Adams is a colleague. Fans working at IBM, Digital Equipment Corp., Hewlett-Packard Co. and The Boeing Co. have admitted to searching company directories looking for him.

In fact Adams, 36, works as an applications engineer at Pacific Bell in San Ramon, Calif. But he's also an astute observer, able to translate workday inanities into examples of the human comedy.

"There are 25 million people working in cubicles who can't say what they are really thinking about management because they would get fired," Adams says. "If there's a utility to the strip, it's that it will tell you what people are thinking but won't say to your face."

His readers definitely agree.

"I've been clipping out the cartoons and pasting them on my door in the hopes that our nontechnical management would read them," says Brian Lalor, a systems analyst at Stanford Linear Accelerator Center in Palo Alto, Calif. "Dilbert gives us a voice and shares our perspective with people who don't live in our technical domain."

Cartoon therapy

For Adams, "Dilbert is an emotional outlet. Particularly in the old days, I had an amazing amount of rage built up. My ability to get my frustration out there for the world to see was very therapeutic. At this point, I do Dilbert more out of amusement. I'm less personally affected by frustration at work now. It just makes good fodder."

Adams says all the positive personalities in Dilbert are composites of friends and co-workers, and in fact, he tells them when they're going to appear in the strip. He sees himself as Dogbert.

Those negative personalities? They're co-workers, too, but so far they haven't recognized themselves. And Adams isn't telling.

Reluctant hero

Ironically, Adams never set out to be the champion of the technical worker. All he ever wanted was to become a world-class cartoonist. At age 11, he applied to the Famous Artists Course for Talented Young People — hoping to open the gates to the world of professional artists. He was turned down.

"It turns out you had to be at least 12," he says.

Later, this son of a Windham, N.Y., postal worker graduated valedictorian of his 40-person high school class. He went on to major in economics at Hartwick College in Oneonta, N.Y.

"It was close to where I lived, I had an academic scholarship, and it had a higher ratio of women to men," Adams says, explaining his choice. He graduated in 1979.

Where it all began

In 1983, Adams found himself in San Francisco — working days at Crocker National Bank, while attending evening courses for a three-year MBA program at the University of California at Berkeley. It was the beginning of Dilbert.

"I noticed that people had that

Adams, *page 101*

In six months,

Why a genius?

Well, when you choose a DECpc™ XL Server you give everyone's productivity a radical boost.

By combining an integrated Fast/Wide SCSI 2 (fastest link to storage peripherals) with a PCI local bus (3 times faster than EISA), the XL Server pumps data through super fast. Files, applications, and graphics snap onto the screen.

Opt for a Pentium™ processor model and everything becomes an ultra-productive blur—especially in midrange file/print and workgroup applications.

But a god?

Sure. After all, you are predicting the future. And providing for it.

With XL Servers, there's plenty of room to grow. 7 slots and 9 bays. And no screws. Just slide our easy-access side panel out of the way to get to all of your disks and I/O cards.

And if you want to upgrade processors, that's simple, too.

Pop in one of our daughtercards and go as far as you want to go.

Through future releases of the Pentium chip. Even over to RISC and our mind-bending Alpha AXP™ processor. 5 Volts, 3.3 Volts —it doesn't matter. This machine runs them all.

Of course, some things even a god can't predict.

they'll call you a genius.

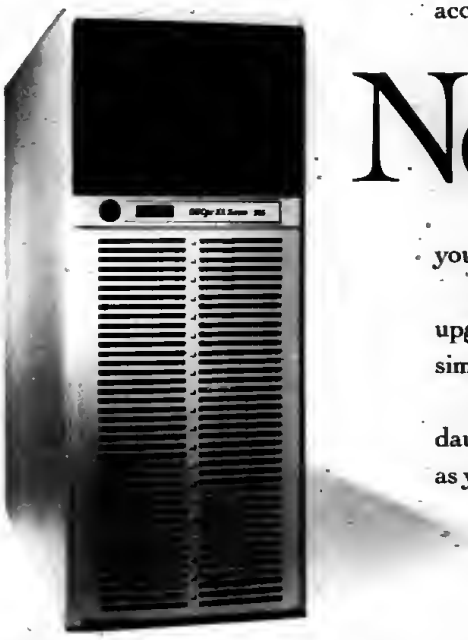
But don't worry. With our 3-year on-site limited warranty, we come to you if there's a problem. That means quick turnaround and less down-time.

People will probably be impressed with your choice of an XL Server in a lot less than six months.

And in a year, they'll be downright grateful.

Call 1-800-610-8831.

Please reference BEL when you call.
8:30 a.m. to 8:00 p.m. Mon-Fri ET.



Next year, a god.

digital™
PC
Beyond the box.

© DIGITAL EQUIPMENT CORPORATION 1994 The DIGITAL logo and DECpc and Alpha AXP are trademarks, and Beyond The Box is a service mark of Digital Equipment Corporation. Pentium is a trademark of Intel Corporation

The Informix 1994 Worldwide User Conference And Exhibition

July 11-14 Tampa Convention Center

Reengineering. The radical redesign of your organization's information technology. Reengineering sets the stage for profound improvements in productivity and performance that will last far into the future. And it's what the 1994 Informix Worldwide User Conference is all about.

Join us in Tampa, where:

- Keynotes include James Champy, co-author of the best-selling *Reengineering the Corporation,* as well as a blue-ribbon industry analyst panel.
- Parallel processing and object-oriented development are just a few of the technology trends we'll put under the microscope.
- Some of the most successful client/server technology available will be exhibited by dozens of hardware and software vendors.

From start to finish, this is a conference you shouldn't miss.

Register Today!

Take advantage of our special, early-bird registration offer! It's simple—call **1-800-247-0262.** We'll send you all the information you need.

1994 Exhibitors:
(PARTIAL LIST)

ACUCOBOL
ADVANCED DATA TOOLS
APPLIED AUTOMATION TECHNIQUES, INC
AT&T GLOBAL INFORMATION SOLUTIONS
BROCK CONTROL SYSTEMS
CONCEPTS DYNAMIC, INC
DATA CODE, INC
DATA GENERAL
DGC
DIGITAL EQUIPMENT CORP
DP-TECH COMPUTERS
FOUR SEASONS SOFTWARE
FOURGEN SOFTWARE INC.
HEWLETT-PACKARD
IBM
INFORMATION BUILDERS
INFORMIX
IQ SOFTWARE
JETECH DATA SYSTEMS INC
LOGIC WORKS
MICROSTRATEGY
NETWISE, INC.
NEXGEN SI, INC
OPENLINK SOFTWARE INTERNATIONAL, LTD
OPENVISION
OPENWARE TECHNOLOGIES, INC
PERFORMIX, INC
POWERSOFT CORPORATION
PROMARK
PYRAMID TECHNOLOGY
RECOGNITION INTERNATIONAL INC
RELEVANT BUSINESS SYSTEMS
REPORTSMITH
SAP
SEQUENT COMPUTER SYSTEMS
SOFTWARE DEVELOPMENT GROUP
SOFTWARE INTERFACES
SPECTRA LOGIC
SUN MICROSYSTEMS
SYMBOL TECHNOLOGIES
TECSYS INC
UNIFACE
UNISYS
VISIGENIC SOFTWARE INC
WINDSTAR CORPORATION
WOLLONGONG GROUP INC.

Learn About Reengineering From One of the Movement's Founders—Special Keynote Session

James Champy, Co-Author, *Reengineering the Corporation,* vice president, Computer Sciences Corp., president, CSC Consulting

Don't Miss Our Special Industry Analyst Panel: "The Latest Trends in Database Technology"

Donald Feinberg, program director, Software Management Strategies service, Gartner Group

Joseph Gottlieb, vice president and director of Open Computing & Server Strategies service, META Group

Judith Hurwitz, founder and president, Hurwitz Consulting Group, Inc

INFORMIX®

The Sears Tower, illustrated on the Informix marketing materials for this conference, is a registered trademark of Sears, Roebuck and Co. Informix is grateful to Sears for its generous permission to use the illustration for this limited purpose. No endorsement of Informix products is intended by use of this mark.

© 1994 Informix Software, Inc. Informix is a registered trademark of Informix Software, Inc.
All other names indicated by ® or ™ are registered trademarks or trademarks of their respective owners.

Adams

CONTINUED FROM PAGE 98

potato-shaped body with glasses," he says. "I used that shape to doodle a composite of my co-workers."

By 1986, Adams was working at Pacific Bell, at about the same time as he received his MBA.

Once his studies were finished, Adams found he suddenly had time on his hands. He filled that void by drawing cartoons — lots and lots of them — and by pursuing cartoon syndication with a vengeance.

Widespread praise

Dilbert reached the nation's newspapers in 1989. Since then, he has won the respect of management consultants around the country.

Re-engineering guru Michael Hammer has called Adams "the preeminent business thinker [and observer] of the late 20th century."

WHERE TO FIND DILBERT

Scott Adams' Dilbert comic strip is syndicated in 175 newspapers nationally, including the following major newspapers:

- The Boston Globe
- Chicago Tribune
- Dallas Morning News
- Denver Post
- Detroit News
- Houston Post
- Milwaukee Journal
- New York Newsday
- Philadelphia Daily News
- San Francisco Examiner
- Seattle Post-Intelligencer

Management pundit Tom Peters even provides the voice-over for the "Dilbert on Quality" video from Cohen/Gehler Associations, Inc. Its Dilbert Business Video series provides one- and five-minute openers for a variety of business meetings, including quality, managing change and sales.

Both sides agree

"When we licensed Dilbert for these videos, we were intrigued that the strip was popular with both managers and employees," says David Gehler, president of the Boston corporate communications firm.

"Frankly, I think Scott Adams is the most insightful business humorist around today," Gehler says.

That insight, by the way, should prove valuable to managers who pay attention.

Maybe what they're really thinking is that you need to read more Dilbert. ■

Garner is a free-lance writer in San Carlos, Calif.

THE DILBERT BOOKS

Scott Adams has published three Dilbert books to date, with his fourth due out this month. Dilbert's collected wit and wisdom can be found in the following titles:

1. **Build a Better Life by Stealing Office Supplies** *(Kansas City: Andrews & McMeel, 1991).*
2. **How to Avoid Meetings with Time-wasting Morons** *(Kansas City: Andrews & McMeel, 1992).*
3. **Dogbert's Clues for the Clueless** *(Kansas City: Andrews & McMeel, 1993).*
4. **Shave the Whales** *(Kansas City: Andrews & McMeel, due May 1994).*

Calendar

MAY 8-14

Meeting The Global Challenge. Anaheim, Calif., May 8-10 — Contact: Beth Bolog, National Center for Manufacturing Sciences, Ann Arbor, Mich. (313) 995-7962.

Conference on Interactive Marketing/East. Orlando, Fla., May 8-11 — This conference will specifically cover interactive TV. Focus: Anatomy of an interactive deal, interactive telephone, online services, interactive advertising, video games, new interactive cable networks and more. Contact: Interactive Marketing, Inc., Los Angeles, Calif. (310) 473-4147.

Enterprise PC. Carlsbad, Calif., May 8-11 — Focus: "Desktop Strategies for the 90s." Contact: Technologic Partners, New York, N.Y. (800) 869-6963.

'94 Masters Conference. Atlanta, May 8-13 — Contact: Structured Solutions, Atlanta, Ga. (404) 618-7000.

1994 Micro Focus Conference. San Francisco, May 9-13 — Contact: Micro Focus User Conference Headquarters, Palo Alto, Calif. (415) 496-7356.

Technology from Russia '94 Conference and Exposition. Washington, May 10-12 — Contact: J. Spargo & Associates, Inc., Fairfax, Va. (703) 631-6200.

Decision Support Center 1994 Conference. Naples, Fla., May 10-13 — Focus will be on data center, network, applications, distributed computing, outsourcing and quality/value. Contact: Real Decisions, Darien, Conn. (203) 656-1500.

Boole & Babbage Users' Group '94. Chicago, May 11-13 — Contact: Boole & Babbage, Inc., San Jose, Calif. (408) 526-3000.

Re-engineering/Hammer Forum & Clinic 94. Boston, May 11-13 — Focus: "Large-scale Re-engineering: Reinventing the Entire Enterprise." A landmark conference on the next wave of re-engineering. Contact: Hammer and Co., Cambridge, Mass. (617) 354-5555.

1994 Internal Customer Satisfaction Conference. San Diego, May 12-13 — Contact: The Conference Board, Inc., New York, N.Y. (212) 339-0345.

No Boundaries — The Global Connection. Orlando, Fla., May 13-15 — Contact: Sharyl Bradley-Hennard, The Society of Telecommunications Consultants, Boca Raton, Fla. (407) 852-7071.

MAY 15-21

The Annual Data Dictionary/Respository Symposium. Atlantic City, May 15-18 — Contact: Data Administration User's Group, Bayonne, N.J. (201) 823-4800.

EIS/94 Agenda. Rockville, Md., May 15-18 — The EIS/94 program stresses information technology in action. Contact: Emergency Information Systems (EIS) International-EIS/94 Conference Registrar, Rockville, Md. (301) 739-6900.

The Seventh International Software Quality Week Conference. San Francisco, May 17-20 — Software Quality Week focuses on advances in software test technology, quality control, risk management, software safety and test automation. Contact: Software Research, Inc., San Francisco, Calif. (415) 957-1441.

Government Technology Conference. Sacramento, Calif., May 18-19 — Topic tracks include results-oriented government, enterprising government, customer service enablers, leveraging technology, emerging technologies and networks. Contact: Deborah Furlow, Government Technology Conference, Sacramento, Calif. (916) 363-5000.

Object Technology and Management & Designing Object-oriented Libraries: The Art & the Science. Chicago, May 19-20 — Speaker will be Bertrand Meyer, president of Interactive Software Engineering, Inc. (ISE) in Santa Barbara, Calif. Contact: ISE, Goleta, Calif. (805) 685-1006.

MAY 22-28

International Communications Association (ICA) Expo Dallas '94. Dallas, May 22-23 — Both conference and exposition will focus on strategic issues involved in managing the enterprise network. The full range of communications solutions, from office LANs to intercontinental voice/data networks, will be demonstrated among the exhibits and discussed in the conference. Contact: ICA, Dallas, Texas (800) 422-4636.

SynOptics Users Group Conference. Santa Clara, Calif., May 22-25 — Keynote speakers from SynOptics Communications, Inc. Contact: SynOptics Users Group, Santa Clara, Calif. (408) 988-2400.

Viasoft, Inc. User Conference. Phoenix, May 22-25 — Contact: Viasoft, Phoenix, Ariz. (602) 952-0050.

First Ever Manufacturing Execution Systems Association (MESA) Roundtable. Chicago, May 23-24 — MESA International is a not-for-profit trade association whose members are vendors of integrated MESA and related technologies, including point solution, hardware platforms, database, systems integration services, data collection technology, controls and consulting services. Contact: Bill Hankanson, MESA International, Pittsburgh, Pa. (412) 781-9511.

Home Banking Forum. Chicago, May 23-24 — Theme: "Home Banking in an Interactive Age." Keynote speaker is Wesley C. Tallman, executive vice president of Visa International product and market development and president and CEO of Interlink. Contact: Faulkner & Gray, Inc., New York, N.Y. (212) 967-7180.

Principles and Techniques for User Interface Design. Ann Arbor, Mich., May 23-25 — Contact: Engineering Conferences, The University of Michigan, Ann Arbor, Mich. (313) 764-8490.

DB/Expo '94: Database, Client/server & Technology Exposition & Conference. San Francisco, May 23-27 — Keynote speakers: Bill Gates of Microsoft Corp., Philippe Kahn of Borland International, Inc., Larry Ellison of Oracle Corp., Steven Jobs of Next Computer, Inc. and Umang Gupta of Gupta Corp. Contact: Blenheim NDN, Inc., Mountain View, Calif. (415) 966-8934.

Re-engineering Business Processes. Itasca, Ill., May 24-25 — Contact: David W. Burke, Sandra Cone Associates, Chicago, Ill. (708) 395-7990.

First Annual On-demand Digital Printing & Publishing Strategy Conference & Exposition. New York, May 24-26 — Show targets commercial printers, publishers, quick-copy print providers and service bureaus, as well as corporate, government and institutional offset and laser printing, high-speed copying and MIS/data centers. Contact: Expocon Management Associates, Inc., Fairfield, Conn. (203) 256-4700.

LAN/Securities and Exchange Commission '94. Washington, May 24-26 — One-day optional preconference workshops on May 23 and optional postconference workshops on May 27. Focus: The whole spectrum of LAN security and control challenges. Contact: Pam Bissett, MIS Training Institute, Framingham, Mass. (508) 879-9792.

Strategy Conference and Exposition. New York, May 24-26 — Contact: Expocon Management Associates, Inc., Fairfield, Conn. (203) 256-4700.

Twelfth Anoual Information Management Conference. New York, May 25-26 — Contact: The Conference Board, Inc., New York, N.Y. (212) 339-0345.

Annual 1994 Midwest Computer Show. Rosemont, Ill., May 25-27 — Contact: Illinois Certified Public Accountant Society's Continuing Professional Education Dept., Rosemont, Ill. (312) 993-0393.

MAY 29-JUNE 4

Spring Internet World '94 & Document Delivery World '94. San Jose, Calif., May 31-June 3 — Sponsored by *Internet World* magazine and The Commercial Internet Exchange. Contact: Schwartz Public Relations Associates, New York, N.Y. (212) 677-8700.

CAUSE/Coalition for Networked Information Regional Conference. Philadelphia, June 1-3 — Sponsors: The Coalition for Networked Information is a joint initiative of CAUSE, EDCOM and ARL. CAUSE is the association for managing and using information technology in higher education. Contact: CAUSE, Boulder, Colo. (303) 449-4430.

Re-engineering: The Implementation Perspective. Cambridge, Mass., June 1-3 — Provides an introduction to the concepts and objectives of re-engineering with an analysis of the business factors driving it. The instructor will be Michael Hammer, The Center for Re-engineering Leadership, Cambridge, Mass. Contact: Hammer and Co., Cambridge, Mass. (617) 354-5555.

1994 AME Best of the Midwest Regional Conference. Chicago, June 2-3 — Theme: "Leadership Beyond the '90s." Keynote speakers: Allan Cox, the head of Allan Cox & Associates, and Phillip R. Thomas, founder and chairman of Thomas Group, Inc. Contact: Association for Manufacturing Excellence, Wheeling, Ill. (708) 520-3282.

Viscomm West. San Francisco, June 2-4 — Features three comprehensive conference programs including The Photo Conference for professional photographers, the Grafix Conference for graphic communications professionals and the Prolab Conference for photo lab owners and managers. Contact: CMC, Norwalk, Conn. (203) 852-0500.

JUNE 5-11

Technologies '94. Fort Lauderdale, Fla., June 5-8 — Keynote speaker will be Anne Peter, president and CEO of Instruction Set, Inc. in Natick, Mass. Contact: Technologies '94, Fort Lauderdale, Fla. (301) 490-2056.

Third Annual Geographic Information System (GIS) in Business Conference & Exposition. San Francisco, June 5-8 — Contact: GIS World, Inc., Fort Collins, Colo. (303) 223-4848.

XDB Fifth Annual International User Conference. Annapolis, Md., June 5-8 — Focus: "Navigating Your Client/server Course." Contact: Michael Donner, XDB Systems, Inc., Laurel, Md. (800) 488-4948.

Ziff Institute's Interactive '94 Conference & Expo. San Jose, Calif., June 5-8 — Focus will be on authoring, technology and training, workplace support and technology and corporate multimedia. Contact: Ziff Institute, Cambridge, Mass. (617) 252-5187.

Technology Transfer and Other Joint Venture Opportunities in the New India. Washington, June 6-8 — Keynote speakers: Naresh Chandra, senior advisor to the prime minister government of India, N. Vittal, secretary of telecommunications government of India. Contact: BDA, Inc., Washington, D.C. (800) 394-9390.

Object Expo. New York, June 6-10 — Sponsored by *Object Magazine*, C++, *Journal of Object-oriented Programming* and "The Smalltalk Report." Contact: Mike Doolittle, SIGS Conferences, Inc., New York, N.Y. (212) 274-0135.

1994 Internal Customer Satisfaction Conference. New York, June 7-8 — Contact: The Conference Board, Inc., New York, N.Y. (212) 339-0345.

JUNE 12-18

Applied Dynamics International Users Society (ADIUS) '94. Ann Arbor, Mich., June 12-15 — Contact: Applied Dynamics International, Ann Arbor, Mich. (313) 973-1300.

NetSec '94. San Francisco, June 13-15 — Contact: Computer Security Institute, San Francisco, Calif. (415) 905-2218.

JUNE 19-25

International Conference On Computer Architecture (ISCA) '95. Margherita Ligure, Italy, June 19-23 — Sponsored by ACM, the Association For Computing Machinery, Special Interest Group ARCH and IEEE-CS. Contact: Joseph Fisher, Hewlett-Packard Co., Palo Alto, Calif. (415) 857-5110.

OCT. 2-8

1994 NASIRE Annual Conference. San Francisco, Oct. 3-5 — The theme will be announced at a later date. Contact: NASIRE, (606) 231-1905.

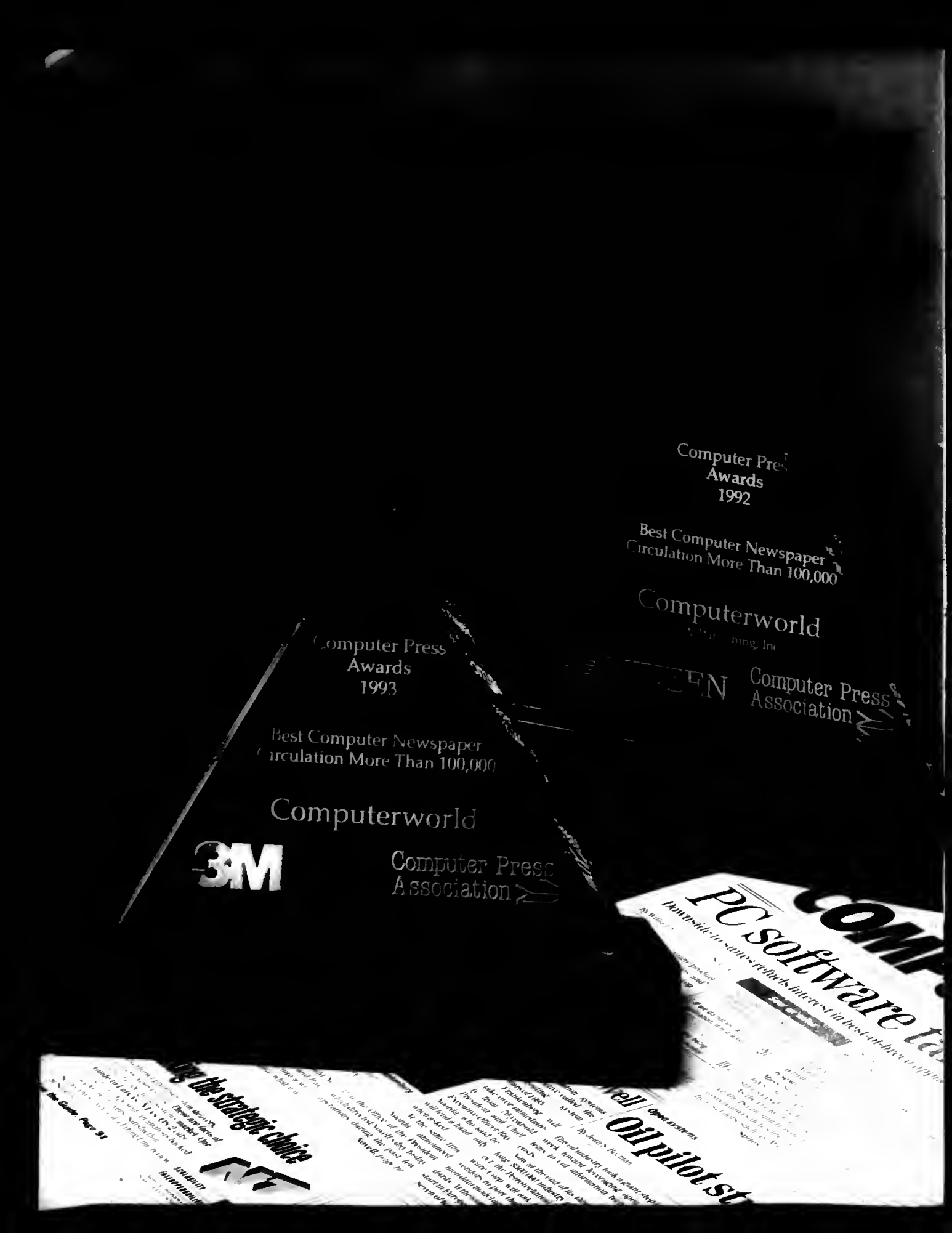
[illegible]
future [illegible]
ment [illegible]
ONcore [illegible]
next-generation [illegible]
accepts *all* [illegible]
media *modules* [illegible]
your *network* [illegible]
And it offers *high speed* [illegible]
you can upgrade *to* [illegible]
networking services [illegible]
What could be better?

INVESTING FOR THE FUTURE ISN'T THE PROBLEM. DOING IT EVERY 18 MONTHS IS.

Anixter. *Nobody knows networking like we do. Like how to expand it with Chipcom's ONcore Switching Hub so you won't have to expand your budget. And we'll be there every step of the way with certified technical expertise and support you can [illegible] day after day. Year after year. When it [illegible]*

ANIXTER | CHIPCOM

1-800-ANIXTER


Computer Press
Awards
1992
Best Computer Newspaper
Circulation More Than 100,000
Computerworld
Computer Press
Association
Computer Press
Awards
1993
Best Computer Newspaper
Circulation More Than 100,000
Computerworld
3M
Computer Press
Association
PC software ta
Oil pilot st

Computerworld puter Newspaper."

Being chosen *"Best Computer Newspaper"* two years in a row in the Computer Press Awards is quite an honor. In fact, Computerworld is the only publication to have done so. Our editorial staff is what made it all happen. Collectively, they hold many years of journalism experience in information technology — expertise recognized not only by the computer vendor and user communities, but by the general press as well. Thanks to Computerworld's consistently high journalistic standards, information systems professionals get the "Best Computer Newspaper" every week.

Alan Alper • Allan E. Alter • Johanna Ambrosio • Gary H. Anthes • Charles Babcock • Melinda-Carol Ballou • Mitch Betts • Ellis Booker • Jean S. Bozman • Mary Brandel • William Brandel • Connie Brown • José E. Bruzual • Kevin Burden • Rosemary Cafasso • Erin Callaway • James Connolly • Lisa Davidson • Lory Zottola Dix • Ellen Fanning • Stephanie Faucher • Chris Flanagan • Michael Fitzgerald • Janell Genovese • Kimberly Gilliard • Paul Gillin • Linda Gorgone • Michelle Grabon • Mark Halper • Thomas Hoffman • Elisabeth Horwitt • Maryfran Johnson • Stuart J. Johnston • Patricia Keefe • Joanne Kelleher • Michelle Keyo • Julia King • Stephen P. Klett Jr. • Nancy Kowal • Bill Laberis • Joseph Maglitta • Christina Aicardi Maguire • David Marshall • Stefanie McCann • Catherine McCrorey • Anne McCrory • Tom Monahan • Kim S. Nash • Jodie Naze • Lynda Radosevich • Garry N. Ray • Jay F. Rizoli • Ed Scannell • Aleksandra Skulte • Derek Slater • Kimberlee A. Smith • Craig Stedman • Michael Sullivan-Trainor • Rich Tennant • Jaikumar Vijayan • Mary Beth Welch • David B. Weldon • Lorraine Witzell • Jill Zolot

OUTERWORLD

The eighth annual Computer Press Awards
in New York City. Co-sponsors
and the Comput

We've Opened Up a Whole New Way to Look at Open Systems Management

OpenVision. It's a philosophy, a company, products, services, and business practices all focused exclusively on solving open systems management challenges. In fact, we're the one-source resource for distributed, heterogeneous, client/server systems management solutions.

With OpenVision, our innovation gives you the advantage. You select products from our comprehensive, integrated suite of best-of-breed systems management solutions in operations, performance, storage, and security. You're supported by a full range of fixed-price, customer-centric services that support our "no shelfware" commitment. And you benefit from our innovative platform-independent pricing that lets you upgrade your computing environment without additional license fees.

We think it's the most innovative vision in systems management. But don't take our word for it, make us prove it. Want to hear about it first hand? Call us to reserve a seat at one of our upcoming seminars. Want to read about it? Request a copy of *Open Systems Management: The Challenge of a New Era,* one of the issues from our OPENVISION**INSIGHT** series of open systems management reports. Both are free, both will open up your eyes to a whole new perspective on open systems management. I-800-223-OPEN.

OPENVISION.

OpenVision is a trademark of OpenVision Technologies, Inc

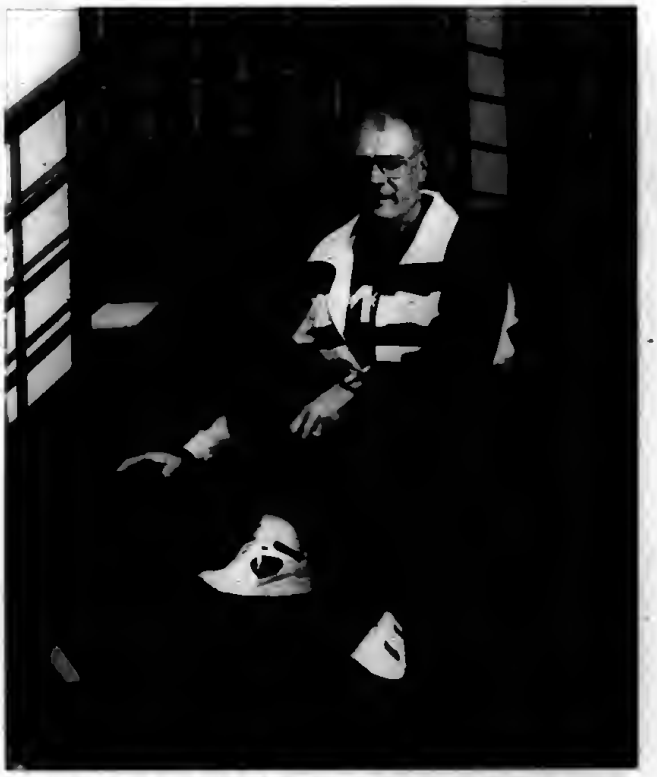
EXCLUSIVE SURVEY

What do you think are the cause and cure for requirements creep?

SEE OUR EXCLUSIVE SURVEY, PAGES 108 AND 110.

Are you a victim of creeping user requirements?

NO MORE CREEPS!



GEORGE CIENCIA

Terry Marksberry, CIO at The Meredith Corp., *says the company had to scrap a nearly 10-year-old development project whose creeping requirements pushed it to three times its original budget. "It was such a god-awful mess," he says.*

When IS staffs have to make significant changes to systems after they have frozen requirements and begun development, schedules and costs balloon. But some tech chiefs are fighting back by working more closely with users and by just saying 'no' to late changes.

BY GARY H. ANTHES

The last sad entries in the project manager's notebook read like the medical record of a dying patient: "Usage levels continue to drop. Company's financial situation grows worse. New management enters picture. Config project is terminated."

Config, an artificial intelligence application intended to help configure computer systems, suffered a needlessly long illness. A notebook entry dated 11 years earlier, when this real-life systems development project was just getting under way, raised this red flag: "Prime mover behind Config project is concerned that the company's [intended users] are not showing enough interest in the project."

Config was the victim of a familiar pattern known as "scope creep" or "creeping user requirements," a budget- and schedule-busting phenomenon that results when significant system changes are made after requirements are supposedly frozen and software development has begun. It cost this particular company tens of millions of dollars, according to Mark Keil, an assistant professor at Georgia State University.

Creep, *page 108*

Creep

CONTINUED FROM PAGE 107

"Scope creep is a big problem," Keil says. "When we talk to people about what project management difficulties they are having, that will be the first thing out of their mouths."

Keil says the problem often results from users not knowing what they want until they see it — or don't see it. In the case of Config, however, the problem was more insidious.

"Sometimes scope creep is a manifestation that users don't want the system," Keil says. "But rather than saying they don't want it, they say, 'I think I would use it if it just had this feature or that feature.'"

Config's would-be users were computer salespeople, and Config was to have helped them put together highly complex and error-free system configurations at order time. Problem was, the computer company rewarded sales volume, not order quality. Rather than just admitting they did not care much about configuration details, the sales reps made excuses for not using the system. The excuses became scope changes, and the project plunged into troubled waters.

Widespread problem

"Scope creep is one of the show-stoppers," says James Willbern, national director of KPMG Peat Marwick's Runaway Systems Management practice. "Our experience is that all projects have overruns."

Still, not all information systems managers admit it happens on their watch. While a whopping 80% of 160 IS professionals recently surveyed by *Computerworld* say requirements creep "always" or "frequently" occurs, 20% say it seldom happens (see chart at left).

Asked why requirements get out of hand, the highest number (44%) cite "poor initial requirements definition" as the leading cause. Half as many (22%) say the cause is management failures after the requirements definition phase (see chart page 110).

Willbern says an organization's top management often must share in the blame. "Executives want to know what it's going to cost on Day 1, and that's where a lot of CIOs get into trouble," he says. "They commit to a number without having any idea what it's really going to be."

Willbern says IS managers often also do a poor job of managing expectations — both users' and senior managers'.

Enough is enough

The Meredith Corp. scrapped a subscription fulfillment application development project when it was almost a decade old and at three times its original budget. Expectations were clearly not managed, says Terry Marksberry, chief information officer at the Des Moines, Iowa-based publishing, real estate and broadcasting company.

As Meredith's business changed, developers constantly strove to hit a moving target rather than develop a baseline system they could modify later. Experts recommend such an approach, but developers, eager to please users at all costs, often ignore it.

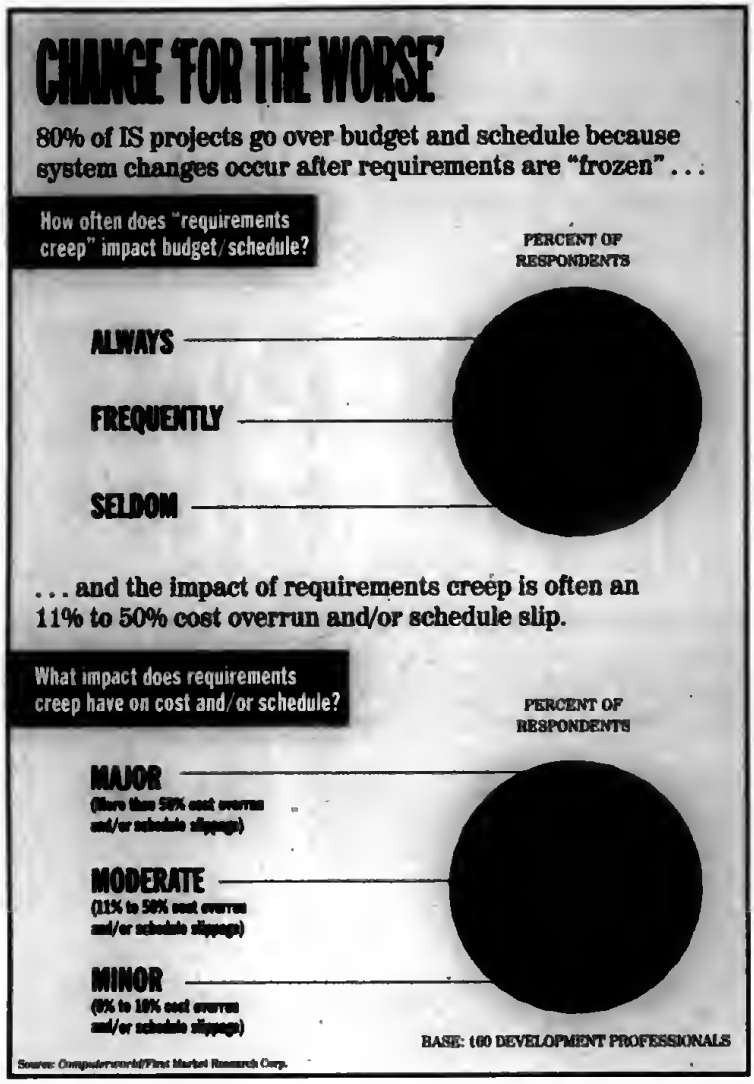
"You need to start off with a clean set of requirements and put a stake in the ground," Marksberry says. "That was not done. The scope [of the project] kept creeping and creeping, and by the time the system neared completion, it was such a god-awful mess [that] it really didn't do what it was supposed to do. You have to put a fence around it and say, 'Here's the project, and here's the funding for it.'"

Meredith's fences are elastic. Marksberry says cost estimates contain a 10% to 20% contingency allowance. "We allow for an 'oops' factor," he says.

What do users think?

Gary Buda, vice president of operations at Meredith's real estate group, says scope creep has not been a problem in the projects in which he has been involved. One reason is that in the real estate group, end users design applications with help from IS, not the other way around. He says fully one-half the effort that went into designing an accounts receivable

Creep, *page 110*



Function points to the rescue

Errol Shim, former quality manager at Cincinnati Bell Information Systems, says the company recently completed a telephone billing system of extraordinary complexity. "They couldn't get a handle on when it would end," Shim says. "The president wanted an estimate, and he was told it would take three months to prepare the estimate. I did it in a week."

Shim did it with function-point analysis, which has given him an estimating track record of 85% to 90% accuracy, he says.

IBM developed the function-point concept in 1979. It is a sizing methodology based on counting an application's key components — inputs, outputs, inquiries, internal files and interface files — and then weighting those counts by rough measures of complexity to arrive at an unadjusted function-point count.

The count is then adjusted by additional factors that assess the complexity of the system overall on the basis of communications needs, performance goals, reusability objectives, multiple sites and so forth.

The development cost associated with a function point is remarkably constant within a class of applications — much more reliable than the traditional lines-of-code estimating technique — and is a highly reliable tool for understanding and pricing out the consequences of new system requirements, according to its adherents.

"The average cost to build a function point in the U.S. is about $1,000," says Capers Jones, software development guru and chairman of Software Productivity Research. "You can tell users that through the design phase a new requirement will cost $1,000 per function point, from design to testing it will cost $1,200, and during testing it will cost $2,000, for example."

According to Shim, now director of process improvement at U.S. Shoe Corp. in Cincinnati, the method provides a rigorous and credible way to convince the boss that the system cannot be developed for the figure he might have had in mind. It is also helpful in make-vs.-buy decisions, outsourcing decisions and in deciding when it makes more sense to develop a new system rather than enhance an old one.

— Gary H. Anthes

Don't Risk A Power Failure.

The promise of power is exhilarating, but it takes more than promises to get things done.

The PowerBuilder™ demo was convincing. But like the Russian Presidency, it lacks the power to solve tough, real-world problems.

Why buy an illusion of power, when you can take real power with Gupta™?

The easy, visual programming environment of Gupta SQLWindows® offers proven power for even the toughest applications.

With the help of our exclusive team programming facilities, every challenge can be met by leveraging the productivity of a team. Gupta's SQLBase® adds fast, robust database performance for PCs, from LAN servers to notebooks. And SQLNetwork™ assures connectivity to corporate data in DB2®, Oracle® and Sybase®.

Only Gupta delivers a full system for developing and deploying client/server applications with the power to stay the course.

Let Gupta's Client/Server System help you pull off a coup in applications development.

Call 1-800-876-3267, Ext. 117 today for your free *SQLWindows/PowerBuilder Competitive Brief.*

FREE COMPETITIVE BRIEF
1-800-876-3267 Ext. 117

Gupta. The Power To Get Client/Server Done.

GUPTA™
POWERFUL PRODUCTS. SOLID SOLUTIONS.

© 1994 Gupta Corporation • 1060 Marsh Road, Menlo Park, CA 94025 • 415/321-9500 • Fax 415/321-5471
Quest, SQLBase, SQLGateway, SQLRouter, SQLHost, and SQLTalk are registered trademarks of Gupta Corporation. SQLWindows is a licensed registered trademark and TeamWindows, ReportWindows and EditWindows are licensed trademarks exclusively used by Gupta Corporation. Gupta and SQLNetwork are trademarks of Gupta Corporation. Other trademarks are the property of their respective owners.

Creep

CONTINUED FROM PAGE 108

system now nearing completioo came from his staff of end users.

At a previous employer, scope creep was rampant, Buda says, because IS was centralized and treated as a corporate expense; users had no direct financial stake lo their projects. "People didn't do careful design work up front," he says. "It was sort of like, 'I need a system to do this. Here, IS guys, go do it.'"

By contrast, at Meredith, projects are funded out of the business units for which they are intended. In addition, IS people have a dual reporting relationship to IS management and business unit management. "IS people working on the real estate side of things take day-to-day direction from me," Buda says.

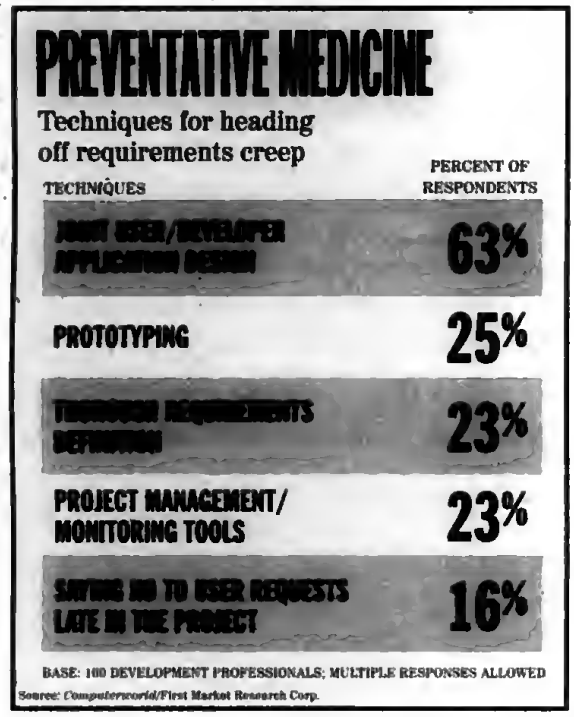
Timothy Lister, a principal at Atlantic Systems Guild, Inc. in New York, says project managers often find it hard to refuse users, even when they know creeping requirements are jeopardizing a project's schedule and budget. In the *Computerworld* survey, only 16% of IS respondents report they say "no" when users demand significant changes well into the development cycle (see chart above).

"How much can you absorb for free? The answer is, remarkably little. There is no slack in most IS schedules," Lister says.

He says one helpful approach is for top management to set up a configuration management board outside the project so the project manager is spared being the bad guy when user requests are denied or deferred.

Capers Jones, chairman of Software Productivity Research, Inc. in Burlington, Mass., says requirements creep at 1% per month, on average, from the time the requirements definition is ostensibly completed to when system testing ends. Thus, in a typical two-year development project, about one-fourth of what is delivered is not anticipated at the outset.

Jones recommends the use of function-point analysis as a way to help control scope creep (see related story, page 108). "Function-point concepts are starting to show up in a lot of contracts because it makes creeping user requirements crystal clear, and it enables you to assign a cost to them when they occur," he says.



Jones and most other software development experts also recommend prototyping and joint application development (JAD) sessions between users and developers as ways to involve the user more intimately in the development process at an early stage. These techniques should help preclude unpleasant surprises later. "They are extremely effective and have a long track record of success," Jones says. "Used together, they can make a 3- or 4-to-1 reduction in unplanned requirements."

To head off requirements creep, 63% of *Computerworld*'s survey respondents say they use JAD — the most often-cited method — and 25% say they do prototyping.

Keil, however, says there are no silver bullets for this problem, only good management. For example, he says good project managers are those who can explain to users the cost and scheduling implications of their requests and, if possible, get them to agree to defer them until after the base system is up and running.

Beginning step

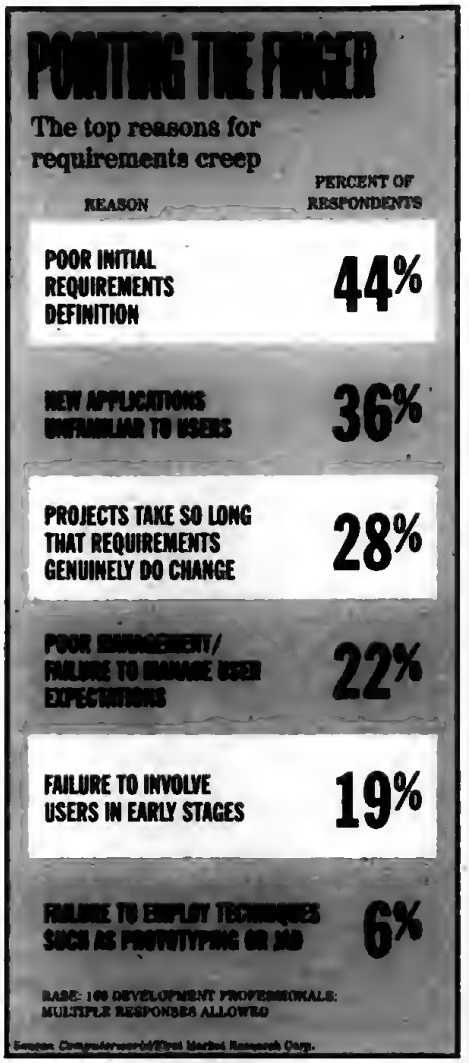
"JAD and prototyping are great things, and we do them all," says Dennis Klinger, vice president and CIO at Ryder System, Inc., the truck rental and leasing firm in Miami. But he says Ryder has inserted a "premethodology" step at the very beginning of a project, one intended to derive a rough, business-oriented vision for the system — a vision shared by clients and developers.

"Senior IS people who are very familiar with the business sit down with the clients and brainstorm," Klinger says. "There's a lot of give and take. Together you can come up with a broad vision that neither of you might have come up with alone. You do a kind of business-level triage that is in some ways a scope agreement."

That is followed up with a brief written vision statement that outlines what is to be done and sets high-level objectives and some major boundaries.

That framework then becomes a backdrop for the JAD, prototyping and methodology pieces of the traditional development life cycle, Klinger says. ■

Anthes is a *Computerworld* senior correspondent in Washington.



An attack on ambiguous requirements

What we have here is a failure to communicate, says James D. Palmer, information technology professor at George Mason University in Fairfax, Va. "The reasons for requirements creep are relatively straightforward. We just don't do requirements engineering very well. It's the process that's not right."

The key cause of the problem is written system specifications that are ambiguous or inconsistent, he says. To address those weaknesses, research is under way at the university to improve developers' use of natural language and to augment natural language with formal methods and models.

The Advanced Integrated Requirements Engineering System (AIRES) is a set of automated tools developed in a research project at George Mason to help users and designers accurately and unambiguously specify requirements. It translates English language specifications into machine-readable diagrams and detailed specification statements. Those can be input to computer-aided software engineering tools for use by programmers in generating code.

Although AIRES is experimental, it is now used by several federal agencies that develop very large, complex systems, Palmer says. "Our goal is to remove ambiguities, inconsistencies, conflicts and redundancies in the English language requirements, to try and repair those before making the transformation into code," he says.

— Gary H. Anthes

Computer Careers

On the fringe

Massively parallel processing systems won't be in most data centers anytime soon, but they are coming

By Alan Radding

"Massively parallel processing must be adopted for a business to be successful in the 21st century," declares Gartner Group, Inc., which projects that the commercial MPP market will exceed $4 billion by 1997.

The reality, however, is that MPP is rare in commercial computing. Given that these systems cost millions of dollars, the few hundred million dollars in sales that Gartner projects for commercial markets this year doesn't translate into that many systems. Although it's expected to move into the mainstream for such computing challenges as massive centralized databases, MPP remains bleeding-edge technology for now.

KEEPING up

The MPP world only just began shifting its focus from scientific technical computing. There, MPP machines solve complex computations, often involving massive data sets.

In the commercial world, MPP systems will initially be used for decision-support applications that mine huge databases. Companies such as American Express Co. use MPP systems to splice their massive databases to identify buying patterns. In a few years, when MPP systems become more robust, they can be used for transaction processing, says David Frankel, director of technology at the Smaby Group in Minneapolis.

Careers in MPP, however, are only just evolving. "There are not yet a lot of MPP systems out there," cautions Paul Barth, vice president of technology for high-performance computing at Epsilon in Burlington, Mass. Companies like Epsilon, which deploy MPP systems, need MPP programmers, but the number of such companies is still tiny. Down the road, more will need developers who can build MPP applications using the emerging high-level tools.

However, MPP is not likely to replace other forms of commercial computing. "It only makes sense with large, centralized databases," Frankel says.

As MPP becomes mainstream, the best preparation is the same as for open systems and client/server computing—SQL and Unix. ■

Radding is a free-lance writer in Newton, Mass.

Three careers are developing around MPP, each requiring different skills:

Vendor-oriented

These careers focus on building MPP systems and supporting customers. The position requires a computer science background and skills in C, Fortran and Unix. "These are top-level people," explains Dale Fisher, director of customer support at Thinking Machines Corp. in Cambridge, Mass. They work with customers to implement the system. As MPP machines proliferate, Fisher predicts that this career will change to consulting. Vendors will require people with world-class, state-of-the-art skills in advanced operating systems and compilers.

MPP programming

Currently, there are few off-the-shelf applications, so early user companies have to create their own in C, C++ and Fortran, explains Paul Barth, vice president of technology for high-performance computing at Epsilon, a subsidiary of Amex. Barth, who has advanced degrees in computer science, started his MPP career at Thinking Machines providing support for the Epsilon installation. Then he switched to the client side. "There is a high demand for people with the ability to take MPP technology and deliver production solutions," Barth says.

MPP application

This is where the market is heading. As products such as Oracle Corp.'s Oracle 7 and various high-level tools become available, careers will evolve for those who can use the tools to develop MPP applications. Except for database administrators, who will still need specialized knowledge about the system's underlying structure, these positions won't require extensive experience in parallel technology. "Organizations will be buying a black box. They will run their Oracle application and not care about the parallel details," says David Frankel, director of technology at the Smaby Group. Parallelization will take place in the operating system, out of sight of the high-level application developers. For these positions, experience with Unix, SQL and high-level tools will be required.

PRO-STAR

SALT LAKE CITY
DP PROFESSIONALS

A Western U.S. leader of System Integration and MIS Consulting services, we've doubled each of the last 2 years in Salt Lake's thriving business environment. To meet the demands of our Fortune 1000 clients, we need:

- CLIENT SERVER: OOP/GUI experts, including Powerbuilder (we'll train in 3.0), Visualbasic, Gupta, C++/Windows, and Oracle, Sybase, Informix
- SR. ANALYSTS: Manufacturing, IE/CASE background, strong data modeling, Client Server a plus. ORACLE & VAX a plus
- 3GXX: ADABAS/NATURAL, IMS, DB2

Selected positions with excellent benefits and growth opportunities into Account/Project Management. Please contact: PRO-STAR, 1100 E. 6600 S., Suite 200, Salt Lake City, UT 84121. 801-266-6138, FAX 801-266-0068.

VITAL COMPUTER SERVICES
a leading consulting firm, has long & short term projects in the NYC Metro area. Top Rates.

UNIX (HP/UX) SYSTEMS ADMINISTRATORS
assist with the installation & implementation of new systems utilizing HP/UX & UNIX (SVR3, SVR4)

SYBASE DATABASE ADMINS

SYBASE PROGRAMMERS
State of the art environment all new development

Please call or fax resumes to Chris, Vital Computer Services (212) 971-3400 Fax: (212) 629-8747

★ GET OUT OF TOWN ★
NATIONWIDE
OPPORTUNITIES
YOUR HOME TOWN MAY HAVE MANY JOBS, BUT NOT YOUR CAREER OPPORTUNITY. THE COMPUTER TECH NETWORK OF 140 NATIONAL COMPUTER SEARCH AGENCIES SPECIALIZES IN THE NO CHARGE PLACEMENT AND EMPLOYER PAID RELOCATION OF COMPUTER PERSONNEL TO ALL AREAS OF THE U.S.A. & OVERSEAS. TOLL FREE 1 800 752-3474 FAX (314) 256-9991
COMPUTER TECH NETWORK
21410 Center Ridge Rd. Rocky River, Ohio 44116

GUPTA SQL

ORCA Technology & Search—the Southeast's leading information systems search firm—is seeking multiple (12–15) GUPTA SQL client-server software engineers for outstanding full-time opportunities with our client in Charlotte, NC, a Fortune 500 developer of Health/Hospital information systems.

In addition to GUPTA SQL, we have several positions (full-time & contract) for IS professionals with the following:

- ◆ ORACLE DBA's
- ◆ COBOL/CICS/DB2
- ◆ Sybase, Informix
- ◆ SAP, BPCS, JDE
- ◆ PowerBuilder
- ◆ Powerhouse, COBOL
- ◆ Visual Basic
- ◆ ASK MAN, VAX COBOL

◆ Big "6" Managers/Consultants—Client Server, CASE (SEER, IEF, ADW), Imaging, Re-engineering, Industry (Food/Beverage, Cost Mgmt, Retail, Mid-Range, Textile, Banking, Healthcare).

Our clients offer a great comp/benefits package as well as our beautiful North Carolina locations. Please mail resume (with salary req.) to: ORCA Technology & Search, 312 W. Trade St., Suite 700, Charlotte, NC 28202, Attn: Tom Stalling, or FAX to (704) 376-1363. EOE M/F/D/V.

ORCA Technology & Search

CLIENT/SERVER

INSTRUCTORS

Greenbrier & Russel is expanding technology's leading edge in education. We currently have excellent career opportunities for instructors with 3+ years of professional systems experience and at least 6 months Client/Server application development experience in one or more of the following:

- PowerBuilder
- SQL Windows
- Sybase/SQL Server
- C, C++
- Visual Basic
- Windows SDK
- UNIX
- Visual C++

Previous teaching experience preferred but not required. Travel required.

Greenbrier & Russel offers an excellent compensation and benefit package. Please forward your resume to: **Greenbrier & Russel, Inc., Attn: Hiring Manager, 1450 E. American Lane, Suite 1840, Schaumburg, IL 60173. Fax: 708-706-4020** EOE M/F/D/V

GREENBRIER & RUSSEL
Building Strategies for Business Computing
A Platinum Affiliate
Chicago • Milwaukee • Atlanta • Denver

EUROPEAN INVESTMENT BANK

The EIB, the financial institution of the European Union, is currently seeking for its headquarters in LUXEMBOURG

1) Experienced Systems Analysts (m/f) (Ref.: IT 9401)

❑ postgraduate degree or equivalent; ❑ **at least 3 years' professional experience** in systems analysis and/or development of management applications, preferably acquired in banking or finance; a rigorous approach and experience with methodologies for applications development, project leadership and analysis tools.

Knowledge of: 3rd and 4th generation languages (C, Cobol, Powerbuilder, NOMAD Front & Center, REXX), DBMS (SQL/DS and SYBASE), UNIX, local area networks (TCP/IP, Lan Manager), DOS, OS/2, Windows, VM/CMS, office systems.

2) Systems Engineers (m/f) (Ref.: IT 9402)

❑ postgraduate degree or equivalent; ❑ **at least 3 years' professional experience.** Knowledge of an **IBM/UNIX** environment would be an advantage.

The successful candidates will be required to manage servers under **UNIX/SYBASE**, in particular organisation customisation, implementation of procedures and performance monitoring, to provide for efficient administration and operation of servers and data bases. Establishing parameters and monitoring systems development, user support, problem reporting, documentation, proposals for improving the quality of service.

In-depth knowledge of: UNIX platforms and related management tools, local area networks (TCP/IP, Lan Manager, TR...), OS/2 and DOS/Windows servers, DBMS (SYBASE, SQL/DS) and distributed systems architecture in general.

3) Specialists in Systems Architecture Integration (m/f) (Ref.: IT 9403)

❑ postgraduate degree or equivalent; ❑ **at least 3 years' professional experience.**

The successful candidates will be expected to make proposals for the optimal development of the Bank's information systems architecture, efficient data distribution and management applications. Duties will include selection, testing and implementation of software packages and hardware.

Knowledge required: general familiarity with networks and client/server applications, together with an in-depth knowledge of one or more of the following fields: distributed architecture, UNIX platforms, DBMS (SQL/DS, SYBASE), 4th generation and object-oriented languages (Powerbuilder, NOMAD Front & Center...), local area networks (TCP/IP, Lan Manager...), extended networks, electronic mail, electronic document management.

Languages: as the Bank's working languages are **English and French**, excellent knowledge of one and a good command of the other are essential. Knowledge of other languages would be an advantage.

The Bank offers attractive terms of employment and salary with a wide range of welfare benefits. It is an equal opportunities employer.

Applicants, who must be nationals of a Member Country of the European Union and **preferably not over 40 years of age** (vacancies 1 and 2) **or 35 years of age** (vacancy 3), are invited to send their curriculum vitae together with a photograph **quoting the appropriate reference**, to:

EUROPEAN INVESTMENT BANK
Recruitment Division
100, boulevard Konrad Adenauer
L-2950 LUXEMBOURG. Fax: 4379 3360.

Applications will be treated in strictest confidence and will not be returned.

LEAD GUI SPECIALIST

PBC, Inc., a front-runner in the race toward open systems solutions, is selectively seeking candidates for a key position in our new product development group.

If you have significant experience with one of the major GUI development tools like:

- SDK
- MOTIF
- GUPTA/SQL WINDOWS
- POWERBUILDER
- VISUAL BASIC
- VISUAL C ++

and you feel strongly that you are ready to move up to a Technical Lead role, then we would like to talk to you. Management experience is not reqoired.

PBC, Inc. is a very rapidly growing software development, systems integration, and ioformation systems consulting firm, with offices in five major cities across the country. If you meet the above qualifications, or you are interested in finding out about other opportunities with our organization, please call, fax or mail current resume to :

Pittsburgh Business Consultants, Inc.
411 7th Avenue, Suite 1401A
Pittsburgh, PA 15219
phone 412-391-0714
fax 412-391-0478

VAX DATA CENTER MANAGER

Fortune 500 firm is consolidating several VAX sites into a central cluster site. The company is seeking a data center manager with experience managing a large cluster environment providing 24 hour, 7 day a week service to local & remote locations.

The successful candidate will be degreed, conversant with current DEC technology, and have successfully managed a VAX data center involved in a major hardware/software consolidation effort. Our client is prepared to fill the critical need **NOW** and offers a highly competitive salary and relocation package!

SOFTWARE PRODUCT DEVELOPERS & MANAGERS

Our clients have several openings for managers, product developers and product support professionals. These positions are with vendors of IBM mainframe system software products and require coding experience in assembler and knowledge of DB2 at IMS or CICS at VTAM/NCP.

PROGRAMMER/ANALYSTS

The economy is improving and so is the market for experienced Programmer/Analysts. Our clients across the country have immediate needs for P/A's with AS400 RPG III or IBM Cobol with CICS or DB2 or IMS. **Banking or Life Insurance a BIG plus.**

We have 300 affiliated offices throughout the U.S. and Canada to assist in your search.

ROBERT SHIELDS & ASSOCIATES

Robert Shields & Associates
P.O. Box 890723
Houston, TX 77289-0723
713/488-7961 • FAX 488-1496

CONTRACTORS

ALL TECHNICAL SKILLS

NATIONWIDE REQUIREMENTS

We mail your resume to brokers nationwide at no cost to you. Send your resume to:

JKL Enterprises, Inc.
500 North College, Suite 108
Charlotte, NC 28202

1377 K Street NW, Suite 107
Washington, DC 20005
1-800-257-0845
(202) 543-1830
FAX: (202) 543-2230

DATA PROCESSING PROFESSIONALS

Origin is an international software consulting firm with North American headquarters in Columbus, Ohio. Origin Specializes in providing solutions to its client's business objectives. Origin is currently seeking candidates with application development experience in any of the following:

* Progress * Client Server * Open System

Origin offers a competitive compensation and benefits package. To apply please send resume to:

Professional Staffing, Origin Technology in Business, Inc. - II, 1105 Schrock Rd. #616, Columbus, OH 43229. Fax 614-431-3614

COBOL CICS DB-2

PBC, Inc.

411 7th Ave. Suite 14A
Pittsburgh, PA
Phone (412) 391-0714
FAX [illegible]

Programmer/Analysts
Sr. Systems Analyst/Systems Analysts
--OREGON--

Kaiser Permanente InterRegional Common Systems, (IRCS), located in Lake Oswego, Oregon develops, installs, implements and supports applications for 10 Kaiser Regions.

We're currently seeking seasoned Programmer/Analysts and Systems Analysts with experience in the following areas: Data Modeling, Data Flow Diagrams, Structured Charts, and Quality Assurance. Experience with HMO Patient Accounting, Membership Accounting, and Claims Processing is desired. Prior experience working in IBM MVS/ESA, CICS, DB2, IEF, CASE, COBOL, and CSP.

We offer a competitive salary and benefits package. Qualified candidates should send resume to: Administration, Kaiser Permanente, InterRegional Common Systems, [illegible], Suite 300, Lake Oswego, OR 97035. EOE M/F/D/V.

KAISER PERMANENTE

Technical Consultants 40hrs/wk., 9am - 5pm, $41,000/year. Design and develop object-oriented multimedia applications for Windows and OS/2 in a client-server environment with IBM ES/9000 server. Design and implement help-desk systems using Object-Oriented methodology. Design and develop expert systems in Prolog. Develop image conversion applications in OS/2. Tools: Borland C++, OWL, OS/2 PM; EHLLAPI; Smalltalk; POET; ONTOS; Prolog; IVCI. Masters in Computer Science as well as one year experience as a Technical Consultant or Graduate Assistant required. Prior experience must include: designing help-desk systems using object-oriented (OO) methodology, language & database; developing systems using PC & UNIX-based OO Database Management System; developing multimedia applications in Windows and OS/2 using Smalltalk, C++, EHLLAPI and IVCI; developing expert systems in Prolog. Must have proof of legal authority to work permanently in the U.S. Send two copies of resume to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 3 South, Chicago, IL 60605, Attention: Sheila [illegible], Reference #V-IL-[illegible]-L, NO CALLS. An Employer Paid Ad.

Sunbelt Opportunities

[illegible]

SUNBELT RECRUITERS
[illegible]
Attn: Rick Young, C.P.C.

SYSTEMS ANALYSTS: Design, development & implementation of large-scale, complex commercial computer software systems utilizing ADABAS database mgmt system & NATURAL computer language. Supervise project development & systems design for large-scale commercial applications. Analyze business requirements & translate into design & programming of computer systems. Three years exp.required. Exp. to include design of systems utilizing ADABAS & writing complex programs in NATURAL. Exp. to include analysis of business requirements, & managing the design, development & implementation of large commercial computer systems. Must be willing and available to relocate to work at sites throughout the United States on serial assignments of @ 3-9 months duration. $50,000/yr. Send resume with copy of this ad to CPL, 75 Hawthorne Plaza, Suite 2001, San Francisco, CA 94105. EOE.

SOFTWARE ENGINEER: 40 hrs./wk., 8a.m. - 5p.m., $44,500.00/yr. Analyze and develop computer s/w systems utilizing advanced programming techniques on TANDEM VLX and CYCLONE platforms utilizing COBOL, C, TACL, and TAL, and on HP3000 minicomputers utilizing POWERHOUSE s/w. Reqr. Bachelor's Degree in Comp. Sci., Comp. Tech. Reqr. 2 yrs. expr in job offered or 2 yrs. expr. as Systems Analyst/Programmer. Reqr. expr. in s/w development and testing on Tandem m/f utilizing COBOL, C, TAL & on HP3000 utilizing POWERHOUSE. "Employer Paid Ad." E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref.# 28804.

Consultants
IMMEDIATE INTERVIEWS

- MARSHALL & ILSLEY/DDA
- HOGAN/DDA/TDA
- IMS DB/DC, 4 TM; PCS, CPCS; SuperMICR; Vector 8
- CNX; Unix Financial
- Foxpro/Foxbase
- NATURAL 2/ADABASE
- DB2/COBOL/CICS
- POWERBUILDER; Sybase; SQL
- Visual Basic; SAP; Comdisr
- Tandem/TelSvcs84
- AS-400 BP's & PA's

[illegible]

ANALYST/PROGRAMMER - From requirements provide specifications and participate in analysis, design, development, documentation, implementation and testing of required software. Require Bachelor's in Data Processing or Computer Science and 2 years experience in job or related EDP occupation. Experience must include IEF CASE TOOLS, DB2, SQL. $38,000/yr. 40 hrs/wk. 8:00am-5:00pm. Job Site: Beaverton, OR. Send Resume to Employment Department, Attn: Job Order #5550891, 875 Union Street N.E. Room 201, Salem, OR 97311.

Senior Business Programmer (Tampa, FL client site). Design, write, test, implement and maintain RPG III and RPG 400 programs for commercial applications systems in IBM System 38 and AS/400 computer hardware environments. 2 yrs. exper. in job. $39,000/yr; 40 hr/wk; 8:30 a.m. - 5 p.m. Send resume to: Job Service of Florida, 2312 Gulf-to-Bay Blvd., P.O. Box C, Clearwater, FL 34618-4090, Re: JO#FL-1023263.

SOFTWARE ENGINEER: 40 hrs./wk., 8am-5pm, $40,000/yr. Design and develop s/w systems on IBM mainframe for manufacturing applications utilizing CICS, DB2, IMS-DB, COBOL, REXX & CLIST. Carry out requirement analysis, external and internal design. Prepare functional specifications & test data. Provide assistance in system implementation. Reqr. Bachelor's degree in Compr Scnc, Electrical or Mechnel Engrng, 3 yrs. expr in job offered or 3 yrs. expr. as Systems Analyst/Programmer. Experience in developing systems on IBM 3090 utilizing CICS, DB2, IMS-DB, COBOL, REXX & CLIST. "Employer paid ad." E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. No: 28094.

This Space for HIRE! CALL:

800-343-6474

in MA., 508-879-0700, ask for John Corrigan, Vice President Classified Advertising.

COMPUTERWORLD

Weekly. Regional. National.

And it Works!

ExperXence Xbase

By Pat Adams

The new breed of Xbase products currently in beta testing is expected to enable developers to deal with more sophisticated environments.

Rumors of Xbase's death have been circulating for years yet sales continue to grow, making it one of the most widely used programming languages and development environments around.

Its flagging reputation has been strengthened through the purchase of several Xbase product lines by Microsoft Corp., Borland International, Inc. and Computer Associates International, Inc. According to experts, these powerhouses have the marketing, technical and financial resources to move Xbase into the next generation.

Even so, they have some catching up to do to get into the same league as Recital Corp., whose products are equipped with a true active data dictionary. Also under development is Recital's version for the Windows 32-bit environment, which Microsoft does not offer yet.

Microsoft's anticipated FoxPro 3.0, however, is expected to provide a true active data dictionary, be object-oriented and include tools that furnish easy methods of defining class libraries, hierarchies, individual instances and polymorphism.

As for Borland, dBase for Windows is due out next month and will include similar object orientation, but it won't support a true data dictionary.

While the growing installed base alone makes Xbase a good skill choice, other appealing factors exist.

The various Xbase dialects, for example, share the same core syntax and language structure, database file type and core of commands, features and functions. Each product then adds a superset of the same.

For example, the browse feature in FoxPro, dBase and Recital allows a developer to browse through a database in spreadsheet format. At the core level, it works the same way, but FoxPro adds a number of advanced capabilities. Such similarities make it easy to jump from one dialect to another.

Versions under development or in beta testing address advanced technologies in more sophisticated ways than current products. For example, all Xbase flavors are LAN- and wide-area network-ready, except for CA's Clipper. Record and file-locking are built-in, as well as the ability to use files in an exclusive or shared mode.

The FoxPro Connectivity Kit provides Open Database Connectivity to a variety of client/server environments, and dBase can be used as a front end to access Borland's Interbase client/server engine.

Xbase also provides the international features often necessary in multinational companies. The FoxPro line supports a wide variety of foreign languages, including Scandinavian, Greek and Polish.

Yet, the best part of Xbase is that it's relatively painless in terms of price and training. Except for Clipper, all of the products provide an interactive development environment. Moreover, both Borland and Microsoft periodically offer a special $99 price for their interactive versions, as well as trade-in deals for other database products.

Start small, then upgrade

Users can use dBase, FoxPro and Recital interactively to access data and create ad hoc reports or queries. Developers can use them to develop and test applications. Interactive Xbase versions include a variety of tools such as screen painters, menu builders and report and label writers. Programmers simply point on the screen, press a button and the Xbase product creates the source code.

Source code can be run in the interactive version, which makes testing and debugging much easier than the old method of writing, compiling, linking, testing and debugging code.

Developers can work in the interactive versions while they learn, then upgrade to the professional editions, which usually include tools such as .EXE compilers and connectivity kits.

Xbase is similar to English in its programming syntax, therefore the learning curve is less steep than with products such as C++ or Visual Basic. You can find help in journals such as *FoxTalk* and *Reference Clipper* from Pinnacle Publishing in Washington. CompuServe forums such as Foxforum, Clipper forum and dBase forum are also good learning tools. All provide information on local user groups. ■

Adams is president of DB Unlimited, a consulting firm in Brooklyn, N.Y., and an expert on the Xbase family of languages.

A Sterling Opportunity

Sterling Software, a leading international developer of IBM mainframe and PC LAN software, pioneered the concept of storage management over 15 years ago with SAMS:Disk, our multi-function MVS data management system. The continued growth and success of our SAMS family of storage management products has created the need for additional technical staff. We are looking for people who possess a firm understanding of storage management concepts, including the fundamentals of system managed storage, along with superior written/verbal communication and analytical skills.

Sr. Systems Software Engineers/ Systems Software Engineers

Applicants must have a minimum of 5-7 years experience in assembly language development and in the maintenance of IBM system software for the MVS/ESA operating system. In-depth knowledge of MVS/ESA operating system internals is essential; experience with DASD storage management systems such as DF/SMS is a plus. (Ref. SSE-CW)

Sterling Software offers excellent compensation and benefits. Please send resume and salary requirements, including the appropriate reference code, to the

STERLING SOFTWARE
Storage Management Division

Human Resources Dept.
202 E. Airport Dr., #280
San Bernardino, CA 92408
FAX: 909-885-2675

Principals only. No phone calls please. Equal Opportunity Employer M/F/V/D

Computer Consultant/Software Engineer. Design, develop, test and implement global framework, subsequent software application products (e.g. operation management, performance measurement, customer information systems) and graphical network user interfaces for telecommunications (telephone and cellular) industry. Use object-oriented programming, ORACLE, RDBMS, C, C++, PRO*C, SQL*FORMS, SQL*NET, MS/AIX-Windows, CASE tools (ORA*CASE, Design/1), TCP/IP, ULCP on IBM-RS/6000 and IBM-3090 platforms running AIX 3.2 and MVS in performance of duties. Consult with end-users to determine database design and administration requirements. Some Projects performed at client sites in various geographical locations. 40 hrs/week, 8:00 a.m. to 5:00 p.m. $64,000 per year. Minimum requirements: Bachelor's of Science in Computer Science. Computer Science major must include at least one course each in data processing, information systems and system analysis. Must have completed one project in each of the following: 1) Object-oriented programming with AIX-Windows; 2) OLTP Telecommunications software design/development using UNIX-IPC and CURSES; 3) Client/Server based RDBMS internals and support applications. Must have at least 2 years experience in job offered or 2 years experience as a Software Consultant/Software Engineer. Experience must include AIX or UNIX, IBM-RS/6000, IBM 3090X or IBM-RT, PRO*C, SQL*FORMS, ORACLE, RDBMS, C AND C++. Resume required. Must have proof of legal authority to work permanently in the U.S. SEND 2 COPIES OF RESUME TO THE ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 3 South, Chicago, Illinois 60605. Attention: PETE KULA. Reference # V-S. 11288-K. NO CALLS. AN EMPLOYER PAID AD

Contract Programming Sales

NEW OFFICE OPENINGS AND EXPANSIONS

National firm in its fourth decade is expanding its contract services division. We have opened 25 new offices since January 1991 and expect to continue this accelerated rate of growth over the next two years.

We seek:
- Sales professionals for new offices as well as for the expansion of existing branches.

You should have:
- Contract computing or hardware/software sales experience.
- A desire to build for the future.

We offer:
- 30% commission on gross margin.
- An established recruiting force.
- Equity in our firm after one year.
- An established reputation for integrity and excellence.
- A computerized data base of companies and candidates.

We are anxious to hire today. Please send a resume in confidence to the V.P., Consulting Services at: P.O. Box 152109, Irving, TX 75015-2109.

Equal Opportunity Employer

Midwest

PROGRAMMER ANALYST (Ref. #14494) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to clients' needs; analyze, design, develop & implement computer software for clients' electronic data processing systems; analyze, design & develop software systems for taxation & revenue processing of oil & gas industry; requirement analysis, logical modeling, defining automation boundaries arriving at physical model of system & develop programs using relational databases & on-line data communication system use CASE tools during all phases and ES9000, IBM Compatible PC, CICS, DB2, COBOL II, REXX, TSO/ISPF, CLISTS, EXCELERATOR Case Tool MSWORD & MS EXCEL; Reqs. Bach. in Comp. Sci., Engineering, Systems Analysis or its equiv. & 2 yrs. exp. in job offered or 2 yrs. related exp. as a Programmer, Systems Programmer, Programmer/Analyst, Systems Analyst, Software Engineer or Consultant. Will accept 3 yrs. of college ed. plus 3 yrs. of exp. in job offered or in related occup. in lieu of req'd ed. & exp. Related exp. must include, in whole or in part, using IBM ES9000, MVS, TSO, CICS, COBOL, DB2, IBM PC compatible computers & Case Tools; $37,810/yr. 40 hr/wk., 8:30a-5p.

PROGRAMMER ANALYST (Ref. #27194) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to clients' needs; analyze, design, develop & implement computer software for clients' electronic data processing systems; develop, enhance, test & debug large financial application software on Unisys A series mainframe using COBOL, ALGOL, COMS, DMS II, SDF CANDE, TADS, ERGO, BINDER & WFL; Reqs. Bach. in Comp. Sci., Engineering, Systems Analysis or its equiv. & 2 yrs. exp. in job offered or 2 yrs. related exp. as a Programmer, Systems Programmer, Programmer/Analyst, Systems Analyst, Software Engineer, Software Engineer Trainee, Lead Analyst or Consultant. Will accept 3 yrs. of college ed. plus 3 yrs. of exp. in job offered or in related occup. in lieu of req'd ed. & exp. Related exp. must include, in whole or in part, financial application software; Unisys A series, COBOL, DMS 11, ALGOL, COMS, SDF, CANDE, BINDER, TADS & ERGO; $42,000/yr. 40 hr/wk., 8:30a-5p.

SYSTEMS ANALYST (Ref. #12194) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to clients' needs; analyze, design, develop & implement computer software for clients' electronic data processing systems; study existing system & develop new system with necessary changes as required by industrial organization; existing system analysis, design & development of new system based on requirements of different user groups & derive integrated logical data model for new system using IBM ES9000, IBM PCs, CICS, DB2, TSO, ISPF, QMF, JCL & COBOL II; Reqs. Bach. in Comp. Sci., Computer, Electrical or Electronics Engg., Systems Analysis or its equiv. & 2 yrs. exp. in job offered or 2 yrs. related exp. as a Programmer, Systems Programmer, Programmer/Analyst, Systems Analyst, Software Engineer [illegible]

[illegible]

PROGRAMMER ANALYST [illegible]

SOFTWARE ENGINEER [illegible]

PROGRAMMER ANALYST [illegible]

PROGRAMMER ANALYST [illegible] Please send resume to 7210 Woodward Ave, Rm 415, Detroit, MI 48202 & include Ref #. Employer Paid Ad.

SYSTEMS ANALYSTS (3 Positions) - Design/development & implementation of software A.G. Fourth Generation products: NATURAL/ADABAS, NATURAL Construct & Predict for data modeling & system prototyping of manufacturing, production planning & control & materials control systems. Consultation with client management to define system specifications. Reqd. Bachelor's in Comp. Sci., one yr exp. in job offered & relocation to varying client job sites throughout the U.S.A. at six months to one year intervals. $48,000.00/yr., Mon-Fri. 9-5 (40 hrs./wk.). Apply at the Texas Employment Commission, Dallas, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778, J.O. #TX[illegible] Ad Paid by an Equal Opportunity Employer.

Systems Analyst for software consulting company. Duties include consulting with auto maker for CAD-CAM applications specifically on UNIX. Design and develop a knowledge-based software package to perform electrical routing and wiring analysis using object oriented methodology. Duties require working on a variety of platforms i.e., SUN, DEC, and HP running UNIX and using the following software and languages: X-WINDOWS, MOTIF and C++. Requires a Bachelor's degree in Computer Science with at least one course or project in the following: - X-Window programming and Motif. - Knowledge based tools and object oriented programming. Requires two years experience in the job offered or two years experience as a Software Consultant. Salary is $45,000.00. Hours are 8:00 am to 5:00 pm, forty per week. Send resume to 7210 Woodward, Room 415, Detroit, MI 48202. Ref. #[illegible]. Employer paid ad.

Embedded Systems Engineer: 40 hrs/wk, 9 am to 5 pm; $3,500 per month; Work in Electrical Engineering Design Group to develop hardware, firmware and software for new and existing micro-computer-based products. Serve as a bridge between the Electrical and Software Engineering Groups to assure integration of all phases of product design and to ensure a common design goal. Directly support product development by designing hardware, programmable logic, firmware and software which meets project requirements. Develop innovative circuits, firmware and software in entrepreneurial R&D environment designed to maintain the company's technological leadership. Must have B.S. in Electronic Engineering or Electrical and Electronic Engineering. Experience must include 2 yrs. developing real-time embedded systems and software, assembly language programming at the register level and working with microprocessor-based hardware, software and operating systems in both a user and R&D environment and with pixel-level image processing algorithms and television transmission systems and equipment as a researcher or in job offered. Must have proof of legal authority to work permanently in the U.S. Send resumes to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 S. State Street - 3 South, Chicago, Illinois 60605, Attention: SHEILA LINDSEY, Reference # V-IL 11[illegible]-L, NO CALLS, AN EMPLOYER PAID AD - SEND 2 COPIES OF RESUME.

Chief Computer Systems Analyst: Analyze clients' business informational needs & develop programs with system design specifications to guide system development throughout their companies. Evaluate systems & identify & resolve operating problems by developing programs to promote operational efficiency & facilitate long term system usage. Stay abreast of increasing functional/user demands for new or enhanced systems & technological advances, to recommend system changes & improvements & address concerns of clientele. Provide guidance & training to programmers, supervise & coordinate activities of workers providing problem-solving support to computer users, assist in scheduling & determining manpower reqmnts & aid in project cost estimations. Submit project status reports to supervisor. Reqmnts: B.S. in Information Science, 4 yrs. exp. in job offered, as described, or as Systems Engineer. Must have proof of 2 yrs. exp. managing operations & systems security of VAX Clusters, coordinating software projects & supervising systems personnel, completion of 1 academic/professional course in "transaction processing", & proof of legal authority to work permanently in U.S.; 40 hrs/wk, 8:30am-5:30pm; $38,750/yr.; Chicago. Send 2 copies of resume to IL Dept. of Employment Security, 401 S. State, 3 South, Chicago, IL 60605. Attn: Jack Schaefer, Ref # V-IL 11420-J, NO CALLS. An Employer Paid Ad.

CATCH THE SPIRIT!

Schering-Plough HealthCare Products is a $750 million division of Schering-Plough Corporation, cited by Med Ad News as pharmaceutical company of the year and by Working Women Magazine as one of the 100 Best Companies for Working Women.

We have embarked on our largest systems project to date, SPRINT, a multi-million dollar, state-of-the-art, Order Management and Distribution business system. We currently have the following Memphis, TN-based opportunities.

LEAD SYSTEMS TECHNICIANS

Analyze, design, program and test a warehouse and transportation management system. Requires BSCS/equivalent experience and 6+ years' experience including analysis, design and programming to include experience with DEC VAX and "C" programming language. Experience developing and testing transportation and/or warehousing systems.

SENIOR "C" ANALYST

While providing "C" programming expertise, you will implement formal testing procedures and act as a catalyst to educate personnel in "C" programming language. Requires BSCS/equivalent and 3+ years' experience designing and implementing customized "C" programs in a multi-user, production environment. C++ experience, POSIX and OOPS knowledge preferred.

CONFIGURATION ARCHITECT

Direct and manage the planning, configuration, control and integration of computer hardware. Requires BSCS/BSEE/equivalent and 8-10 years' systems experience. 5+ years' experience with hardware configuration; communications between DEC, IBM mainframe and AS/400, and working knowledge of LAN connectivity also required.

SENIOR ABAP ANALYST

Design, code and test programs in order processing and accounts receivable using SAP's ABAP/4 R3 programming language. Requires BSCS/equivalent and 5+ years' data processing/software development experience with 2 years' programming in ABAP R/3.

We offer an excellent salary and benefits package. If you are seeking a career with an industry leader, please forward your resume to: **Schering-Plough HealthCare Products, Attn: HR Manager, 3030 Jackson Ave., Dept YW, Memphis, TN 38151; FAX (901) 320-2057. An Equal Opportunity Employer, M/F/D/V.**

Schering-Plough HealthCare Products

Computerworld recruitment advertising works!

That's because more computer professionals read more recruitment advertisements in *Computerworld* than in any other newspaper.

For more information or to place your ad, call Lisa McGrath at 800-343-6474 (in MA, 508-879-0700).

Weekly. Regional. National. And it works.

An IDG Communications Publication

[illegible] Bank of America [illegible] Baxter Healthcare [illegible] Carolina Power & Light [illegible] Central Maine Power [illegible] Chicago Board of Trade [illegible] Circuit City • Citicorp • Claremont [illegible] Coca-Cola • Comdisco • Computer [illegible] Computerworld • Compuware [illegible] Coors Brewing [illegible] Cray Research • D&B [illegible] Deloitte & Touche [illegible] Virginia Lottery [illegible] Wang [illegible] Wells Fargo Bank [illegible] AIC [illegible] Adage [illegible] Amdahl [illegible] American Management Systems [illegible]

America's Leading Corporations Advertise Their IS Positions in Computerworld. Shouldn't You?

Midwest

SOFTWARE OPPORTUNITIES IN FLORIDA

Florida positions available for P/A's with the following skills

- TANDEM, SCOBOL
- IMS DB/DC
- UNIX, INFORMIX

Please send resume to COMPUTER HORIZONS CORP., 3710 Corporex Park Drive, Suite 250, Tampa, FL 33619. Attn: Jim Helex. Fax (813) 621-1629. An Equal Opportunity Employer M/F

COMPUTER HORIZONS CORP.

DATA PROCESSING & ENGINEERING CAREER FAIR 5/16-17

Michigan Technical Recruiters' Network invites you to meet decision makers of these Detroit area companies:

ADIA Information Tech	EDS
Analysts International Corp	Ford Motor Co – Powertrain
Analytical Technologies Inc	Gale Research Inc
Bartech	Kelly Professional Services
CAP Gemini America	Manpower Technical
Coopers & Lybrand	RST
Computer & Eng Services	Resource Technologies
Comprehensive Data Proc	Sirco Associates Inc
Computer Horizons	Software Services
Compuware	Strategic Staffing Solutions
Decision Consultants Inc	

May 16 - 11am-7pm Management Education Ctr, Troy

May 17 - 2 pm-8 pm Embassy Suites, Livonia

College degree/minimum 2 years' experience preferred. DP – all software languages/hardware platforms/operating systems; Engineering – all disciplines. For more information call 313.882.2277 or if you are unable to attend, fax your resume to 313.882.3626.

supported by: COMPUTERWORLD
DETROIT NEWSPAPERS

SOUTHEAST

Join Computer Consulting Group, one of the Southeast's most dynamic consulting firms and watch your career soar. We are seeking *talented* and *motivated* programmer-analysts and have immediate staff openings through our offices in Richmond, VA, Raleigh and Charlotte, NC, Greenville and Columbia, SC. Our immediate and continuing needs are:

- CICS &/or IMS/COBOL
- WANG/PACE
- POWERBUILDER/SYBASE
- SAP R/3
- Natural/Adabas
- Corporate PC Trainers
- PC/Windows Support Specialist
- AS-400/RPG
- UNISYS/MAPPER
- COBOL/DB2
- Consumer Banking Business Analyst

CCG offers competitive salaries, attractive benefits, relocation assistance and MORE! For immediate consideration send resume or call NOW!

Computer Consulting Group
Contract Professional Services

One Monckton Boulevard
Columbia, SC 29206
1-800-222-1273 • FAX (800) 539-3339
Member NACCB

DATA PROCESSING PROFESSIONALS

COMPUTERMART OF GEORGIA, INC. headquartered in Atlanta, is a leader in Quality Contract Programming and Consulting. Our growth has created opportunities for versatile Professionals with state-of-the-art skills in Programming and Systems Design on all platforms.

Of special interest are the following skills and the ability to relocate or travel: C++/Windows, GUI/OOP, ORACLE, SYBASE, Client Server, Nomad, CICS, PACBASE, LOTUS NOTES, AFP, XYCOR, RPG III, Powerbuilder, D&B Financials, Vantage ONE, & AA Method ONE.

We offer competitive salaries, good benefits including 401K, and a management team that puts people first.

For immediate consideration, send resume to: 7274 Mt. Zion Blvd., Jonesboro, GA 30236-2520. Fax (404) 473-1726. Call Collect.

BECKY FINLEY
(404) 478-5681
COG
EOE

Associate Consultant - to consult with clients to ascertain and define their business requirements to provide solution. Analyzing, designing and developing computer software for clients using ORACLE RDBMS V 7.0, SQL*FORMS 4.0, PRO*C, PL/SQL, SQL*LOADER, SQL*PLUS on HP/UNIX, DEC/VAX platforms. Write Korn Shell Scripts, DCL file transfer using DTF, FTP, RCP. Designing database tables/dictionary using ORACLE*CASE designer/dictionary, updating IMS database. Analyzing algorithms for efficiency. Customer training and interaction and Batch file processing. Unit and String testing of programs using testing techniques. Req'd: M.S. in Computer Science; Must have graduate courses on each in: File Processing Techniques, Operating Systems, Software Engineering, Principles of Database Design, Analysis of Algorithms, Software Testing & Reliability. Thesis in the area of Relational Database using deductive capability of ANSI-SQL. Also req'd. 6 months exp. in th job or 6 months experience in a related occupation such as Graduate Assistant &/or Programmer &/or Database Programmer; Experience must include using ORACLE tools such as ORACLE*CASE, SQL*-FORMS 4.0, PRO*C, SQL*-LOADER and PL/SQL. 40 hrs/wk; 8:00 a.m. - 5:00 p.m., $35,004.00/Yr. overtime as req'd at $17.75/hr. Send resume to 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref # 16994. "Employer Paid Ad"

WANTED: Director of Information Systems: Responsible for the entire computer system of an expanding shipping company with computer links to three U.S. and three foreign subsidiaries in Lithuania, Latvia, Byelorussia. Designs, programs, adapts, maintains, administrates company's database management system, based on Foxpro programming environment, and communications system, based on TBBS and/or Pcboard software and Novell's Netware and/or Lantastic LANS. Req. B.S. in Computer Science and one year experience on the job or one year experience in BBS, Netbios compatible LANs installation, maintenance, programming with relational database management languages, system programming language C/C++ and INTEL 80-86 architecture assembler. Requires fluency in Russian and Lithuanian. 40HRS p. WK. 9-5. 30,000 P.A.. "Must have proof of legal authority to work permanently in the U.S." Send resume to: IL Dept. of Employment Security; 409 S. State Street/3 South, Chicago, Illinois 60605 Attn. Sheila Lindsey, Reference Number: V-IL 11259-L. No calls. An employer paid ad - Send two copies of resume.

SOFTWARE ENGINEER: Develop, formulate and design software systems for Insurance, Financing and Claims Service Systems, using knowledge of Software Design and Development. Convert COBOL programs on Data General System (AOS/VS) to Oracle and C on Solbourne System (OS/MP-UNIX) using knowledge of Database Management System Design and Operating System & Computer Architecture. Develop software testing procedures, programming and documentation to maintain existing and new software systems and to test the converted programs, using principles of Software Design and Development. Provide technical support for software systems and programs developed. Perform and coordinate software system installation, system configuration and management. Requires Master of Science degree in Computer Science with 3 credit hours coursework each in Database Management System Design, Operating System & Computer Architecture, and Software Design and Development, plus one year experience in the job offered or one year experience as Programmer in COBOL. $38,000/year. 40 hrs/wk. Apply at Texas Employment Commission, San Antonio, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778. J.O. #7214807. Ad Paid By An Equal Employment Opportunity Employer.

How to find the Midwest's top computer talent.

New Regional!

1-800-343-6474

Microcomputer support specialist. 40 hour per week, 9:00a.m. until 5:00p.m. $13.00 per hour. Job duties: Installs, modifies and makes minor repairs to microcomputer hardware and software systems and provides technical assistance and training to system users. Four years of direct experience or 3 years of experience as a Data Communications analyst required. Must have proof of legal authority to work permanently in the U.S. Job location - Northfield, IL. Send resume to Illinois Department of Employment Security, 401 South State Street-3 South, Chicago, IL 60605. Attention: Jack Schaffer. Reference #V-IL-8539-J. No calls. An employer paid ad. Send 2 copies of resume.

Midwest/Southwest High Tech Career Fairs

Information Systems ✦Telecommunications ✦Engineering

Dallas May 2-3 Informart

Alcatel Network Systems, Inc.
Andersen Consulting
AT&T
BANK ONE TEXAS
Cap Gemini America
Coopers and Lybrand
Cutler/Williams
CW Systems
Ciber Inc.
Cybertek
DSC Communications Corporation
Ericsson Network Systems
Ericsson Radio Systems
Ernst & Young
Greyhound Lines Inc.
Georgia Pacific
Hertz Corporation
Informix
Interactive Business Systems
JCPenny Life Insurance
JCS Consulting Services
Keane, Inc.
Levi Strauss
Mason & Hanger-Pantex Plant
MBNA Information Services, Inc.
MetroCel
MTW Corporation
NationsBank
Nielson Merchandising Solutions
Nissan Motor Acceptance Corporation
PDX
PageNet
Perot Systems
RELIANCE COMM/TEC Transmission Systems
Ryder Systems Inc
Seer Technologies
Software Solutions
Software Spectrum
Sprint
Structured Software Solutions Inc.
Systemware Professional Service
Tandy Corporation
TIG
Triad Data
Texas Workers' Compensation Insurance Fund
Tober Technologies
The Associates
The Systems Group
USAA
Wal-Mart

Kansas City - April 25

Analysts International Corporation
Andersen Consulting
Computer Personnel Services
Cutler/Williams
DRT Systems International
DST Systems, Inc.
Georgia Pacific
Hertz Corporation
Informix
Lindenberg & Associates
Mason & Hanger-Pantex Plant
Motorola Semiconductor Products
NAIC
PPG Biomedical Systems
Seer Technologies
Sprint

Houston - May 9 Sheraton Grand

Adia Information Technologies
Andersen Consulting
AT&T
Brandon Systems
Cap Gemini America
Computer Task Group
Coopers & Lybrand
Cutler Williams
Decision Consultants, Inc.
DSC Communications Corporation
EDS
Ernst & Young
Hertz Corporation
Intermedics, Inc.
Microsoft Corporation
Paranet Inc.
Staffware
Texas Workers' Compensation Insurance Fund

EEO Qualified Recruitment Events

If unable to attend, please send your resume to:

Career Fair Coordinators - Dept. CW,

PO Box 1458, Coppell, TX 75019
(Please list which location you are interested in)

Sponsored by COMPUTERWORLD and the Southwest Hi-Tech Co-op.

The Leading Technology Fairs.

Healthcare/FLORIDA

GTE DATA SERVICES HEALTHCARE

Technical Analysts/Programmers

3 or more years experience

A major Medicare software supplier seeking professionals with Medicare Part B, A, CWF, or configuration management knowledge desired. Send/Fax resume to:

Human Resources
GTE DATA SERVICES INC.
4655 Salisbury Rd, Suite 200
Jacksonville, Florida 32256
Fax (813) 827-8292

Systems Analyst for software consulting company. Duties include consulting with automaker for CAD-CAM applications. Design and develop client server model to organize finite element models for performing CAE analysis. Duties require working on a variety of platforms i.e., SUN, DEC, and HP, running UNIX and using the following software and languages: X-Windows, MOTIF C and Relational Databases. Requires a Bachelor's degree in Computer Science with at least one course, project or thesis in the following: - Relational Database Management Systems; and -X-Window programming. Requires two years experience in the job offered or two years experience as a Software Consultant. Salary is $46,000.00 per year. Hours are 8:00 am to 5:00 pm, forty per week. Send Resume to 7310 Woodward, Room 415, Detroit, MI 48202. Ref. #18484. Employer paid ad.

• COMPUTER • CONSULTANTS

IBS, a leader in the data processing consulting industry, has been ranked as one of America's fastest-growing companies (INC. Magazine) and is a preferred vendor in WISCONSIN. As we continue our success, we're seeking professionals to work in Wisconsin on a Salaried and Per Project Basis. Must possess 2+ years data processing experience utilizing COBOL, BAL, PL/1 or C with knowledge in any of the following:

- FOXPRO w/WINDOWS
- C, UNIX, ORACLE
- SYBASE
- POWERBUILDER
- SMALLTALK
- METRON/CAP
- ADW/IEW
- HP 3000, POWERHOUSE
- CYBORG
- FOCUS
- SAS
- IDMS, ADSO

We can offer diversity, competitive salaries and excellent benefits. For consideration, please contact: Jill Grno or Diane Rasop, Recruiting & Staffing.

INTERACTIVE BUSINESS SYSTEMS, INC.
205 Bishops Way, Suite 212-CW
Brookfield, WI 53005
FAX (414) 786-7925
(eoe)

Consulting Opportunities...

GILCOR ENTERPRISES, INC. and you!
Headquartered in Chicago, we are a nationwide consulting firm with upcoming projects in the Midwest. We are looking for Technical and Analytical Consultants on a per project basis. Qualified candidates will have senior level experience in one or more of the following areas:

- IMS DBA's, IMS DB/DC Programmers
- Object Oriented, C++
- Client/Server, Unix, OS/2
- Information Warehouse Data Management: DB2, ORACLE, SYBASE
- VTAM/NCP, APPC, LU6.2, TCP/IP
- Systems Programmers: MVS, CICS, VM, RACF, ACF2
- Process Analysis/Reengineering, JAD

Willingness to travel preferred.

Please mail or fax your resume with salary history (principals only, please) to:

GILCOR ENTERPRISES, INC.
Attn: Ms. Judy Reinhardt
17W220 22nd Street, Suite 510,
Oakbrook Terrace, IL 60181-4477.
Fax: (708) 993-0396 • Equal Opportunity Employer

Programmers Sys Analysts Engineers

"C", C++, COBOL, UNIX, AIX, DOS, OS/2, Windows, VMS, POSIX, SCCS, PVCS, CMS, CICS, DB2, Win Drivers & DLLs, DOS Device Drivers, NLM, APIs, Client/Server, Bridges, Routers, Gateways

Bral & Associates
P.O. Box 446
Marion, IA 52302-0446
FAX 319-377-6210

COAST to COAST
100's Openings
S.E. & GULF SOUTH

P/A AS/400	35-45K
P/A DB2	35-50K
P/A VAX/VMS	40-65K
P/A IDMS/ADSO	40K
P/A IMS DB/DC	42K
P/A UNISYS	38K
P/A BANK APPL.	35-45K
P/A Tandem	32-48K
P/A Oracle SQL	38-45K
UNIX/C/C++	38-48K
IBM Systems Prog's	to 65K

Our Company Clients Pay Interview & Relocation expns.

Call Theresa Smith SEC, Inc.
800-768-7708
Fax 800-768-7132

Relocation Assistance Available to CMSI Cities

ATLANTA •
BOSTON •
CHICAGO •
GREENVILLE, SC •
HARTFORD •
JACKSONVILLE, FL •
PORTLAND •

OUR FUTURE HAS NEVER BEEN BRIGHTER!

Information Systems Professionals

Phenomenal growth continues to drive Computer Management Sciences, Inc.! Our proven expertise in client server RAD methodologies, business process re-engineering and multiplatform development has resulted in a tremendous increase in our employee-owners, and expansion to the Midwest.

We are: A Powersoft Powerchannel Partner, a Microsoft Solutions Partner and a TI Strategic Business Partner.

We offer:
- Certified Powerbuilder instruction
- Internal training programs
- An 11 year growth record
- Employee ownership w/excellent profit sharing

We seek:
- POWERBUILDER
- SYBASE, ORACLE
- VISUAL BASIC
- UNIX, C, C++
- X-WINDOWS, MOTIF
- POWERBUILDER INSTRUCTOR
- OS/2, PRES MGR.
- COBOL, CICS
- IMS, DB2
- IEF, IEW, BACHMAN
- OBJECT ORIENT. DEV.
- BPCS

Contact: Robert Farrell, National Recruiting Manager
8133 Baymeadows Way, Jacksonville, FL 32256
FAX: 904/737-6376
PHONE: 800/725-2674

Computer Management Sciences, Inc.

EQUAL OPPORTUNITY EMPLOYER M/F/D

SEEK CONSULTING

Contractors!

WE'RE IN YOUR FUTURE'S MARKET

- ▲ PowerBuilder Oracle
- ▲ PowerBuilder Visual C++, Access
- ▲ SQL/Windows, Windows SDK, NT, Mosi
- ▲ DB2, IMS, CICS, MICROFOCUS COBOL
- ▲ CICS, COBOL, VSAM
- ▲ UNIX, Novell, LAN Administrator
- ▲ Novell, NLM, APPC, SAA
- ▲ HP OpenView, Network Mgmt.
- ▲ ODI drivers, NDIS, Redwork drivers
- ▲ IBM AS/400, RPG, COBOL
- ▲ Visual BASIC, MS-Windows
- ▲ Sybase, Oracle, SQL
- ▲ Oracle tools, X Windows, C
- ▲ C, C++, UNIX, OS/2
- ▲ Prj. Mgrs., Prj. Leaders
- ▲ UNIX Internals, NP UX
- ▲ DEC Networking, VMS Internals
- ▲ VAX, Rdb, DEC Forms, ACMS
- ▲ DSP, Firmware, Analog Devices
- ▲ MACAPP, C++, Object Pascal

Opportunities available throughout the U.S.

Learn more about SEEK contracting opportunities, marketplace info, shareware and games by calling our Electronic BBS at 617-246-8243.

SEEK+

Please send or fax your resume in our Corporate headquarters at: 401 Edgewater Plaza, Suite #430, Wakefield, MA 01880; Attn: Dept. CW; Fax: 617-246-8248, Phone: 1-800-274-1174; Internet: jobs@seekcon.win.net.

Data Analyst, 35hrs/wk., 8am - 4pm, $28,000/year. Develop statistical programs to create graphical and tabulated reports for a large number of healthcare organizations. Perform statistical programming. Assist in analysis of healthcare data. Sample cases for reliability and validity testing. Clear up data discrepancies. Tools: SAS (including PC SAS, Base, SAS/STAT, SAS/GRAPH, SAS/IML, SAS/ETS, SAS/FSP, SAS/OC, SAS Macro Processing, SAS Table Processing and Report Writing); SPSSx; S-Plus; LISP-STAT; URIX; DOS. B.S. in Mathematics or Statistics as well as one year experience as a Data Analyst or Research Assistant - Statistics required. Previous experience must include: SAS, social science and business research; UNIX, DOS. Education must include: computer processing of statistical data; computer hardware and software systems for statistical computing; research statistics or mathematics, including multivariate statistical methods, linear modeling and design of experiments. Must have proof of legal authority to work permanently in the U.S. Send two copies of resume to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 3 South, Chicago, IL 60605. Attention: Pete Kuta. Reference #V-IL-10252-K. NO CALLS. An Employer Paid Ad.

Programmer: Write, test, document, debug, modify and implement statistical, financial, accounting, accounting information, and management information systems database for a non-profit organization on a UNIX platform under a Windows environment and Novell network. Uses structured programming techniques to modify programs including file structures, directives, functions, systems variables, input/output options and mnemonics. Requires M.S. degree in Computer Science. Education to include six months research or six months as a Computer Laboratory Assistant or Supervisor in which the individual performed the management, transaction processing, and program debugging. Must possess undergraduate degree with a major in Accounting including completion of three courses: Accounting Planning & Control; Account Information System; and, Statistical Analysis. 37-1/2 hours per week at $26,000 per year salary. Must have proof of legal authority to work permanently in the U.S. Please send two copies of resume to: Illinois Department of Employment Security, 401 S. State St. - 3 South, Chicago, IL 60605, ATTN: Pete Kuta, Ref. #V-IL 11569-K. An Employer Paid Ad.

Client/Server Developers

Full time and contract client/server developer positions available nationally. Positions require strong GUI/OOPs design background with distributed SQL RDBMS development skills in any of the following areas:

- PowerBuilder, Visual Basic, SmallTalk, C++, Access
- Sybase, MS SQL Server, Oracle

Please mail or fax resume to:

DILAN Corporation
4101-B Stuart Andrew Blvd.
Charlotte, NC 28217
Fax 1-704-527-8755

Competitive Salary Relocation Assistance Attractive Benefits

Technology Consulting, Inc. is a dynamic and rapidly growing Software Development Firm with challenging assignments. We are a leader in application outsourcing. Current client projects and our regional development center require the following skills.

CLIENTSERVER-C,C++, Smalltalk, Visual Basic/ C++, Oracle, Sybase, Powerbuilder, Lotus Notes, Gupta, SQL Windows

AS/400-RPG/400, COBOL/ 400, Synon

MAINFRAME-CICS, IMS DB/DC, DB2, APS, Telon, Natural Construct, Documerge-Lifecom, ALC, EDI

TCI offers competitive salaries, attractive benefits, and relocation assistance. For consideration, send resume or call: **502-589-3110.**

TCI TECHNOLOGY CONSULTING INC.

1800 Meidinger Tower, Louisville, KY 40202 FAX 502-589-3107

FLORIDA

Opportunities

DUNN & BRADSTREET
SERIES⊕ EAM
UNISYS, COBOL, THRIFT
C++, OS/2, VOICE COMM
VISUAL C++, C C++
BORLAND C++, WINDOWS
HP3000, COBOL, UNIX
FOXPRO FOR WINDOWS
CASE TOOL PRODUCT EVAL, ONE ⊕
OOP, UNIX, C++
SORCE⊕, TABLES, BVT
AS/400 RPG III, EDI
AS/400, RPG 400, PREMENOS
OS/2, C, PM
POWERBUILDER, C, SYBASE
AS/400, S/W 2000
MARCAM PRISM
COBOL II, CICS, DB/2
TANDEM, COBOL, SQL
TECHWRITER, MS-WORD
VAX/VMS, COBOL, UNIX
POS, EFT, C, UNIX
C, NOVELL, cBase
POWERBUILDER, SYBASE, WINDOWS

COMPUTER BUSINESS ASSOC.
4800 N. Federal Hwy
Ste 207A
Boca Raton, FL 33431
(407) 362-9666
FAX 362-8666

1511 N. Westshore Blvd
Ste 260, Tampa, FL 33607
(813) 287-2100
FAX 287-2954

CONSULTANTS SHOULD CONSULT

MIMI

IMMEDIATE CONTRACTS
Please send resume & call

Mimi Simon Assoc
90 West St. Suite 1105, NYC 10006

(212) 406-1705
FAX (212) 406-1768

America's Leading Corporations Advertise Their IS Positions in Computerworld. Shouldn't You?

Weber State University
CHIEF INFORMATION OFFICER

The Chief Information Officer is a newly created position which has planning, delivery, and operating responsibility for the computing, telecommunications, media, and data administration resources for a growing public university with 14,500 students and an annual budget in excess of $80 million. The University has made a major commitment to information technology to meet the University's educational and student services goals. This position will report to the President of Weber State University.

The Chief Information Officer is expected to be the institution's leader and advocate for information technology, by giving technology a vision, a focus, and a unified management direction. He or she will (1) lead the University in envisioning and planning the effective use of information technologies within the University's own strategic plan; (2) communicate continuously and substantively with other senior administrators; (3) provide enhanced academic and administrative technology services; (4) administer the telecommunications network; and (5) maintain contact with regional, state, and national information resource organizations.

QUALIFICATIONS Applicants should have strong technical knowledge in computing and communications, broad management experience and leadership ability in related areas, and excellent written and oral communication skills. The University seeks applicants who have at least ten years of increasingly responsible experience, with at least five years in a higher education setting. An undergraduate degree is required; a graduate degree is preferred.

APPLICANTS Should submit a letter of application, resume, one page statement of philosophy concerning information technology in a university setting, and three current letters of recommendation to:

Chief Information Officer, Screening Committee,
c/o Human Resources Department, Weber State University, Ogden, Utah 84408-1016

Review of applications will begin May 27, 1994, but the position will remain open until a candidate is found. *WSU opposes unlawful discrimination and supports affirmative action. The University has a strong commitment to the principles of diversity. In that spirit, we are interested in receiving applications from a broad spectrum of people.*

DATA/NET SERVICES, INC.

We are a Human Resource Management Company

...We're Data/Net Services, Inc., a leader in providing Human Resource Management Systems & Technical Professionals (perm) to Corporate America.

...To continue to provide better value added services to our clients, Data/Net Services offers an **"Exclusive"** resource of technically prescreened candidates through a comprehensive database called **"Data-Link"**.

...All candidates names and contact information are **"GUARANTEED"** to remain confidential and will not be released without prior written approval.

...Our **Data-Link** systems are to many growth related companies from all industries throughout the U.S. and Europe.

...If you are a Technical professional regardless of career position or title and want extreme confidentiality in your career search, **CALL US.**

1-800-374-9737 or Fax 904-355-6715

Data/Net Services, Inc.
1045 Riverside Avenue
Suite 107
Jacksonville, FL 32204

PCS GROUP Client/Server Division is currently expanding our practice into providing complete business solutions on Client/Server architectures. We are searching for highly motivated, high energy individuals who enjoy cutting edge technology and are serious about future professional advancements.

POWERBUILDER

With 6 months or more development experience.

PCS Group offers exceptional training opportunities in our state-of-the-art training facility, outstanding incentives and excellent benefits. For immediate consideration, please fax or send resume to.

PCS GROUP

9300 Shelbyville Rd., Suite 1103, Louisville, KY 40222
502-339-2900 800-682-8784 FAX: 502-339-2888

Work at the leading edge of client server technology in Saudi Arabia

Computer Professionals

HADEED

As part of Hadeed - the Saudi Iron & Steel Company – you'll be working on some of the most advanced I.T. resources anywhere in the world. Indeed, we are now updating our commercial data processing capability with a state-of-the-art client server facility operating on a UNIX based platform via a Novell network.
The application software for the system is SAP R/3 which is intended to provide a fully integrated solution to our data processing needs.
It's the first installation of its kind in the Middle East. More than that, it represents a degree of challenge and investment that could take your career to an even higher level of achievement.
So if you are keen to enhance your and your family's future as well as your finances, consider the following career opportunities:

COMMUNICATIONS AND OPERATIONS

Central to the planned development is the comprehensive network system which will link some 500 workstations across the site. This will call for a professional expertise in communication systems

Communications and Operations Section Head

You will provide hardware, workstation, network and operational support for the systems required by users. Experience in Capacity Planning, Schedule Management and Network Management is essential
Ref: 11466/A

Networking Specialists

We intend to implement an efficient network to provide connectivity for all workstations within Hadeed. Specific vacancies exist in Network Management and Network Administration. Suitable applicants will have a detailed knowledge of Networking, including Novell, PC Software and Data Communications. Additionally a background in Open Systems would be an advantage **Ref: 11466/B**

CLIENT SERVICES

For a successful implementation it is essential that we have an effective service and support organization. To meet this objective we require

Client Services Section Head

In this consultancy role, you will help to meet user requirements – whether purchasing software, implementing in-house development, or contracting out development and programing to external companies. You must be skilled in the application of SAP software, and have successful experience in systems analysis, training and the control of methodologies and standards
Ref: 11466/C

Applications Specialist

You will design Business Applications and specify programs to produce appropriate, high quality systems. This will involve project management, business analysis and the provision of technical advice. Experience in SAP systems development and database design must be supported by knowledge of networking, PC software and open systems techniques
Ref: 11466/D

User Support Specialist

You will provide support, help desk facilities and training for the user community – a role that calls for an excellent track record in providing User Support Services, preferably in a SAP environment, and at least 5 years' supervisory experience within a Data Centre. **Ref: 11466/E**

Workstation Support Analysts

You will support the users of approved workstation software, using your expertise to solve software problems quickly and efficiently. You will also advise on Systems Design, Programing and Controls – and assist in developing and implementing relevant training programs. You must have at least 5 years' experience in PC Network Support, ideally backed by knowledge of SAP, MS products and Novell **Ref: 11466/F**

Training and Career Development Specialist

You will plan, supervise and coordinate the training requirements of staff to ensure successful systems implementation. Training or training administration experience plus practical application of psychometric testing, systems development and commonly used IS software is essential
Ref: 11466/G

TECHNICAL SUPPORT

In order to exploit the effective use of 4 GL's and the latest development tools we are seeking

Technical Support Specialist

Drawing on your proven experience in Programing Management and implementation, you will provide programing services for workstation applications. You must have 5 years' supervisory experience and preferably a working knowledge of SAP **Ref: 11466/H**

Senior Programmer/Analyst

You will be working on the conversion from custom in-house developed systems to SAP R/3 software. Prior implementation and system development experience using APAB/4 programming is required **Ref: 11466/I**

For all positions we will require a degree and 5 to 10 years' relevant experience in a modern systems development environment.

In addition to a single or married status renewable contract, you will be offered a salary package essentially free of tax, enhanced by an end of contract bonus and you will receive benefits including free fully furnished air conditioned accommodation, transportation allowance, fare paid home leave, free utilities and comprehensive medical care

To apply, please send two copies of your resume including a recent passport-size photograph and current salary details (or fax one copy) to our consultants Moxon Dolphin Kerby International, PO Box 19949, Houston, Texas 77224. Fax: (713) 496 6802. Please refer to the appropriate number with your application.

MOXON·DOLPHIN·KERBY

The PeopleRegistry

PeopleSoft Career Opportunities!
Consult or Permanent

FUNCTIONAL
"HR" "Benefits"
"Payroll" "Financials"

TECHNICAL
"PeopleTools" "SQR"
"Microfocus" "SQL" "PS Query" "Crystal Reports"

PROJECT MANAGERS
TECH WRITERS

Please mail/fax resume in strictest confidence to:

P.O. Box 26843
Overland Park, KS 66225-6843
fax (913) 681-0664
call (800) 776-6177

AS/400
Client/Server
Tandem
UNIX

SEVCOR is a leader in Information Systems Professionals.

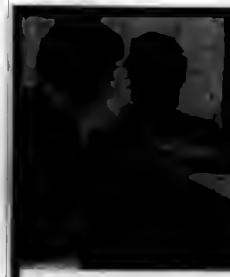
- AS/400, RPG, BPCS, MAC PAC
- AS/Set, SYNON or Lansa
- C, C++, UNIX, OS/2, Windows, X-Windows
- ORACLE, SYBASE, POWERBUILDER, INFORMIX
- TANDEM, COBOL, SCOBOL, PATHWAY, SQL, TAL, BASE 24

SEVCOR **1-800-959-3088**

ORACLE/UNIX
SAS

PBC, Inc.

Tysons Dulles Plaza II
1430 Spring Hill Rd., Suite 540
McLean, VA 22102



"The Registry's specialized resource team understood my expertise and quickly found the right assignment for me."

D'Lon Barfield, Software Consultant

As a leading full-service information technology consulting firm, The Registry provides clients with a variety of business solutions. For two years running, we've been rated as one of the fastest-growing companies in the US by INC. Magazine — and 1994 will be no exception!

Regional Offices:

Atlanta, GA
Boston, MA
Chicago, IL
Cleveland, OH
Dallas, TX
Denver, CO
Durham, NC
Ft. Lauderdale, FL
Greensboro, NC
McLean, VA
New York, NY
Rye Brook, NY
Richmond, VA
Rosemont, IL
San Francisco, CA

Our national specialized recruiting program has set The Registry apart from our competitors. By fully understanding your technical expertise and the project needs of our clients, we successfully find the right consulting opportunity -- for you.

Call our specialists today for short- and long-term projects nationwide:

- **Legacy Systems** - Mike Foley
- **Databases** - Debbie Mines
- **Desktop Computing** - Mike Ford
- **Networks & Communications** - John Byrne and Dan Weiss

In addition to excellent weekly compensation, we provide a 401(k) plan and healthcare options.

Toll-Free: **1-800-248-9119**
Fax: **1-617-527-8805**

Office Spotlight

Boston, MA

- **RPX/SPX Development**
- **MS-Windows/C++/SQL**
- **Open View/SNMP**
- **Sybase/C/C++**

Contact: Mike Hudson
617-527-9119
800-248-9119
Fax: 617-527-8805

The Registry
189 Wells Avenue
Newton, MA 02159
Member NACCB

ANOTHER REASON WHY COMPUTERWORLD RECRUITMENT ADVERTISING WORKS ...

Computerworld gives you large numbers of professionals who work in your industry.

When you're recruiting computer professionals, it's often important to find ones with experience working on systems specific to your industry. From manufacturing to banking, healthcare to insurance, *Computerworld's* audience of over one half million is made up of the right people in every major industry.

INDUSTRY	COMPUTERWORLD'S AUDIENCE
Information Systems "vender" companies (includes consulting)	**192,435**
Computer Manufacturer	72,415
large-scale systems	32,186
mid-range systems	51,326
PCs/workstations	47,195
Software Vendor	112,959
for large-scale systems	49,415
for mid-range systems	88,948
for PCs/workstations	50,801
Non-CPU Computer products manufacturer	23,872
VAR/Dealer/Retailer	29,263
contract DP services	53,003
Consulting/Planning	74,686
Information Systems "user" companies and organizations	**462,930**
Manufacturing (not computers)	101,020
Insurance	52,857
Healthcare	53,838
Banking/Financial Services	68,840
Government Federal/State/Local	85,753
Business Service (except DP)	29,586
Communications Systems	28,985
Public Utilities	56,584
Transportation	31,351
Wholesale/Retail Trade	57,868
Education	104,994

SOURCE: Skill Survey of *Computerworld's* Audience, September 1993.

To place your advertisement regionally or nationally, call John Corrigan, Vice President/ Classified Advertising, at

800/343-6474 (in MA, 508/879-0700)

COMPUTERWORLD
Where the qualified candidates look. Every week.

COMPUTERPEOPLE

Advancing Careers Through Advanced Technology

Join Florida's Leader In Consulting, Training and Permanent Placement

Opportunities available for consulting, outsourcing, site managers, project leaders, programmer/analysts, systems administrators, software engineers & DBAs.

CLIENT/SERVER-OPEN SYSTEMS:
Unix and C (with Informix, Oracle or Sybase)
C (Unix with X Windows)
C++ with MS Windows, Windows NT, Windows NT or OS/2
Powerbuilder
Visual Basic, Visual C

TANDEM:
Tallord C or Cobol/Scobol

IBM:
Terminal & DB2 DBAs
MVS DB2 or MVS IMS DBAs or MVS IDMS DBA's with MS DOS Client or OS/2 experience
Cobol/MVS with Case Tools (IEF, ADW, PACBASE, SAA Foundations)
Application Packages (CA&B or SAP/DCS)
AS/400 PAs

Tampa Bay Area
12225 28th Street North, Suite A
St. Petersburg, FL 33716
800-329-2626 FAX 813-572-1353

Orlando Area
2015 Orange Ave. Suite 1050
Orlando, FL 32801
800-299-9954 Fax 407-894-0153

Jacksonville Area
Fountain Commerce Centre
8375 Dix Ellis Trail, Suite 603
Jacksonville, FL 32256
800-748-9545 FAX 904-464-0290

Ft. Lauderdale Area
5365 Nordon Pkwy
Suite 122
Ft. Lauderdale, FL 33351
800-***-8663 FAX 305-489-0204

CONSULTING POSITIONS
100 Openings

Atlanta, GA
Cedar Rapids, IA
Colorado Springs, CO
Dallas, TX
Denver, CO
Kansas City, MO
New York, NY
Northern NJ
Philadelphia, PA
Sacramento, CA
St. Louis, MO
Washington, D.C.

Aspen Systems Corporation is a $60M employee-owned Information Systems consulting firm. We must staff over 100 new positions within the next thirty days in the midwest. Positions exist for professionals with experience in one or more of the following areas: C/C++ • SQL • DOS • AIX • UNIX • Client/Server • OOP/OOD • MS Windows • OS/2 PM • RS/6000 • VAX • X Windows • MVS/COBOL II/CICS/DB2 • System Design • Software Development • System Testing

Send or FAX your resume to: Aspen Systems Corporation, National Recruiting Office, Dept. WLM, 962 Wayne Avenue, Silver Spring, MD 20910. FAX: (301) 495-8655/(719) 592-9505 or call Len Corey at (800) 638-2784 or (301) 585-8181. EOE/AA.

MIS

Position Available with a $120MM Manufacturing Company. Location - 80 miles NE of Detroit area.

Position reports to MIS Director. To be considered, candidate must have experience in RPG400, PC LAN/Windows environment, good knowledge of financial and accounting applications, manufacturing (Bills of systems), prior experience as team leader, knowledge of Marcam Prism and J.D. Edwards and experience with AS400. The successful candidate will have a four year college degree in a related field.

We offer a competitive benefits package. Submit resumes to:

CW-120474
Computerworld, Box 9171
Framingham, MA 01701-9171
EEO Employer

Software Engineer, 40hrs/wk., 8am - 5pm, $48,000/year. Project management, structured system analysis, design, development, testing and maintenance of on-line and batch-oriented financial and payroll applications using hierarchical, relational database systems and 4GLs in a multi-hardware/multi-software environment including IBM AS/400 and UNIX computer systems. Tools: COBOL; C++, FOCUS, control language (CL). M.S. in Computer Science as well as two years experience as a Software Engineer or Systems Analyst required. Previous experience must include: AS/400; C; COBOL; FOCUS; UNIX or AIX; C++. Send resume with social security number to: Indiana Department of Workforce Development, 10 North Senate Avenue, Indianapolis, IN 46204-2277, Attention: Gene R. Replogle. I.D #3379292.

SAS
Phone: (404) 256-9991
FAX: (404) 705-9135

PBC, Inc.
750 Hammond Drive, Bldg. 6
Atlanta, GA 30328

Programmer/Analysts & Senior Analysts

Sacred Heart Health System is a newly-formed integrated healthcare delivery system consisting of Sacred Heart General Hospital, SelectCare Health Plans and a physicians network. We are currently seeking professionals to be responsible for the enhancement and maintenance of applications in a multi-vendor software and hardware environment.

To qualify, you must have a minimum of 3 years' progressive application implementation experience, preferably in a healthcare or insurance organization. You must also have a working knowledge of DISCorp HCPS, preferably in a source code environment, and COBOL programming experience. Additionally, you must be customer service oriented, self-motivated, a team player and have solid interpersonal and communication skills. Experience with project management techniques and tools and PC applications in a Windows environment is desired as is experience with report writers, screen generators and FOCUS.

In Eugene, you'll find a thriving university town where you can enjoy a multitude of cultural events as well as an abundance of recreational activities in some of the nation's most spectacular settings.

Sacred Heart Health System offers competitive salaries, generous benefits and relocation assistance. For immediate consideration, please FAX your resume to (503) 686-3816. You may also mail your resume to: Sacred Heart Health System, Human Resources, Dept. CW-IS, PO Box 1479, Eugene, OR 97440. We are an equal opportunity employer.

Sacred Heart Health System

COMPUTER PROFESSIONALS

Data Processing OPPORTUNITIES

For 28 years, **Automated Concepts Incorporated (ACI)** has been nationally recognized as a premier software consulting firm. Our continuing success has led to significant growth and challenging new opportunities in

New Jersey, New York, Washington D.C., Chicago and Los Angeles.

We have career opportunities for technical professionals who can match our commitment to excellence. To qualify, you must have a minimum of two years of professional experience including any of the following:

- **C++, OOD/OOP**
- **Lotus Notes**
- **UNIX/C, RDBMS and/or GUI Development**
- **DB 2/CICS or AS/400 RPG**
- **Windows Development**
- **APS**
- **Microfocus COBOL and Tools**
- **Imaging/Workflo**

ACI offers competitive salaries plus a comprehensive benefits program including medical and dental coverage, savings plan, training and more.

For immediate consideration, mail or fax your resume in confidence to: **Nikki Lovison-Marks, National Resources Manager:**

AUTOMATED CONCEPTS INCORPORATED
90 Woodbridge Center Drive, Suite 400
Woodbridge, N.J. 07095 USA
FAX (908) 602-0230

aci automated concepts incorporated

We are an equal opportunity/affirmative action employer

FRUIT OF THE LOOM

We're well-known for our ability to expand.

Fruit of the Loom's underwear and activewear products are the first choice of people all over the world for their quality, durability . . . and comfortable fit. We are also recognized as one of the most dynamic companies when it comes to adding new products, increasing our sales (nearly 2 billion in 1993), and aggressively pursuing innovation in manufacturing and in the marketplace.

Due to our growth, we currently offer the following opportunities:

SENIOR PROGRAMMER ANALYSTS

Individuals should have a minimum two to three years experience as a programmer analyst, developing systems in an MVS or AS/400 environment. COBOL or RPG400 programming background required.

SENIOR SYSTEMS ANALYSTS

Individuals should have a minimum five to seven years experience as a systems analyst or project leader implementing new systems in an MVS or AS/400 environment.

SYSTEMS ANALYSTS

Individuals should have a minimum two to three years experience as a systems analyst, designing and developing systems for manufacturing applications in a distributed systems environment. Experience should be in an MVS or AS/400 environment.

Our City Is Growing, Too...

Bowling Green, Kentucky, continues to attract industry and people for quite a few reasons. The quality of life here is excellent, the cost of living affordable. Home to Western Kentucky University, we boast progressive school systems, great cultural and recreational opportunity, warm, friendly people, and proximity to Nashville and Louisville.

We offer a competitive salary and benefit program as well as the opportunity for you to "expand" professionally. If you have skills in the above areas and would like the opportunity to join a winning team, please send resume to **Fruit of the Loom, Inc., c/o Personnel Dept. CW593, P.O. Box 51607, Bowling Green, KY 42102. NO AGENCIES, PLEASE.**

FRUIT OF THE LOOM.

An Equal Opportunity Employer M/F/D/V

370 Assembler / MVS Internals

•Dev Dasd storage mgmt products (DB2+)	75k
•SE's-Pre-post sales programming (db conversions), systems (multi) & DBA (DB2, IMS, Oracle, Informix, IDMS, Sybase)skills desired (US territories)pkges to	100k
•DBA MGR or Director-IMS/DB2 w/Oracle or Unix	90k+
•Dev IMS MVS Performance Monitor (C desired)	90k
•Dev VSAM util's (exp'd from idea to mrkt)	75k
•Product Supp-1,2 & 3 stor mgmt or Dasd DB2 or VM oracle or file transfer w/MVS/Unix or VMS	80k
•Dev MVS network protocal - C BAL VTAM Lu6.2	90k
•IDMS DBA 60k// *Focus PA 55k// *SW sales or mgmt	

Note: Each of these listings represents many openings nationwide!

SYSTEMS SPECIALIST

Computerworld has an opportunity for a Systems Specialist to provide hands-on technical support for remote office operations. You will be responsible for performing preventative maintenance, servicing equipment, diagnosing and correcting problems as they occur. You will also provide ongoing training for the staff and be responsible for designing and implementing office automation projects.

For this position, we require strong knowledge of desktop hardware (IBM PC's and clones, Macs and all peripherals), operating systems (DOS, Windows, Mac System 7), Novell Networking and Email. Familiarity with Lotus Notes and Internet a plus. Two years of related experience and a Bachelor's degree in Computer Science is preferred.

For immediate consideration, please send or fax your resume to **Leticia LeHane, Operations Manager, 500 Airport Blvd. Suite 400, Burlingame, CA 94010 Fax · 415-347-8312. We offer outstanding benefits, a progressive work environment, and we are an equal opportunity employer ... by choice.**

COMPUTERWORLD

SMALLTALK ARCHITECTS DEVELOPERS

Southeast
Northwest

We currently have numerous opportunities available for SMALLTALK Professionals to support exclusive client projects. Minimum of six months experience in SMALLTALK required.

TCI offers competitive salaries, attractive benefits, and relocation assistance. For consideration, send resume or call 502-589-3110

TCI TECHNOLOGY CONSULTING, INC.

1800 Metinger Tower
Louisville, KY 40202
FAX 502-589-3107

CONSULTING

Contract Solutions is offering long-term consulting opportunities locally and throughout the United States. Most positions pay between $80,000-$130,000 per year.

◆TUXEDO, RDBMS, UNIX, C	◆VISUAL BASIC, WINDOWS 3.1
◆SYBASE, C, UNIX	◆GUPTA API
◆PL/SQL, ORACLE	◆HP OPENVIEW, LANS
◆CAS, IDMS, ADSO	◆OS/2, C, APPN/APPC
◆HOGAN, DMS/DB	◆TOKEN RING, SNA, NET DESIGN
◆COBOL II, CICS, VSAM	◆PPP, X.25, NETWARE TEST
◆AS/400, COBOL, RPG	◆ULRTIX, SYS MGR.
◆DB 2, CICS, COBOL	◆OSF MOTIF, UNIX
◆ORACLE FINANCIALS	◆C, C++, OS/2
◆C, VAX/VMS, RDB	◆C, C++, WINDOWS 3.1
◆SYBASE, POWERBUILDER	◆ALPHA, OSF/1, C
◆WINDOWS NT, C	◆SOLARIS, C, C++
◆SOLARIS SYS. ADMIN.	◆C, UNIX, TCP/IP

CONTRACT SOLUTIONS

Two Keewaydin Drive
Salem, NH 03079-4875

tel 603-893-6778
Fax. 603-893-4208
800-998- CSI ! (2741)

RECRUIT THE BEST!

Place your advertisement in regional or national editions of *Computerworld's Computer Careers* section. For more information call Lisa McGrath.

800-343-6474
(in MA, 508-879-0700)

C Programmers UNIX OR MS/DOS

PBC, Inc.

Denver Corp. Ctr - Tower III
Denver, CO 80237
Phone: (303) 694-5371
Fax: (303) 694-5372

TANDEM

COBOL, PATHWAY, TAL
SCOBOL, C, SQL, X.25

STRATUS

PL1, COBOL, C, ONG

MUMPS UNIX

SUN, HP, RS/6000, GUI, SDK, PowerBuilder, C++, Visual Basic
Full-time/Consulting Positions available in the US/MIDEAST

STRATEM

800-582-JOBS
TEL (212)967-2910
FAX (212)967-4206
124 W. 30th St. Suite #302
New York, N.Y. 10001

TANDEM PROFESSIONALS

COBOL • SCOBOL • TANDEM C • SQL

PROJECT MANAGERS • PROGRAMMER/ANALYSTS-ANALYSTS

Penn Center West II, Suite 430
Robert Dougherty-MS 0774
Pittsburgh, PA 15276
(800) 969-0099 (412) 787-3070 (fax)
Equal Opportunity Employer

CISCORP

CISCORP is a preferred service provider for Tandem solutions nationwide. Office locations:
Pittsburgh, Pennsylvania • Sunnyvale, California • Atlanta, Georgia • Philadelphia, Pennsylvania

Third party products mentioned herein are trademarks or registered trademarks of their respective companies.

Best Technology Easy To Use.

We don't believe in tradeoffs.

That's probably why in a recent Brand Preference Survey, **Computerworld** readers chose Micro Focus COBOL Workbench as the top finisher in the Best Technology and Easy to Use categories. At Micro Focus, we create business application development environments that meet the most stringent technical challenges without sacrificing usability.

It takes special people to turn technology into solutions. If you're technically savvy and customer driven, consider one of our numerous consultant opportunities and work on a contract basis in a major U.S. city.

CONSULTANTS

Contracts Available Nationwide

By working with the leading IS organizations throughout the country, you will provide the expertise needed to resolve issues and keep our customers working productively.

To qualify, you must have a minimum of 5 years of experience in mainframe MVS COBOL, CICS, IMS DB/DC, as well as experience with Micro Focus Workbench, Dialog System, AD/MVS and any Micro Focus Add-On tools under DOS, OS/2, Windows, Windows NT, AIX or UNIX®. Novell LAN or LAN Server experience is a plus, as is prior consulting experience using Micro Focus Workbench for mainframe offloading. Strong verbal communication skills in problem-solving situations are required.

For immediate consideration, please forward your resume to our corporate headquarters at: Micro Focus, Dept. DKM, 2465 East Bayshore Rd., Palo Alto, CA 94303. FAX: 415-496-7248. Internet: dkm@mflid.co.uk Equal Opportunity Employer M/F/D/V. Principals only. UNIX is a registered trademark of UNIX System Laboratories

MICRO FOCUS

Field of Dreams

The Experts now has over 100 FT positions and LONG-TERM consulting assignments (salaried or hourly rate) in THE HEARTLAND OF AMERICA... Cedar Rapids, Iowa.
We offer relocation assistance and a full benefits package.

Project Mgrs. (MIS Project/Facilities a plus)	**System Admin.**
DOS, C Prog./Testers	RS/6000 P/A's
Unix, C Programmers	OS/2, C
Configuration Mgrs.	DEC VAX, C
RS/6000 QA Testers	Cobol II, DB2
	Cobol II, ADABAS

Cedar Rapids offers high quality of life—low cost of living—excellent school systems!

Please fax résumé and call Megan O'Brien.

The Experts
5690 DTC Blvd., Suite 170E
Englewood, CO 80111
1-800-886-0800 Fax 303-843-0994

We also have opportunities available throughout the country.
EOE

Senior Software Engineer. 40 hrs./wk., 8am-5pm; $46,000/yr. Job requires a Master's degree in Computer Science and 2 yrs. experience in Job Offered or as a Systems Analyst. Job also requ.: 1) 2 published papers or Master's thesis in the area of graphics; 2) 1 graduate course in artificial intelligence; & 3) 2 grad. crse. in operating systems. Job duties: Develop engineering software & Graphical User Interfaces in an X-Windows/Motif environment. Plan, design, implement, & test system & application software for networking, client/server, databases, & networking systems. Develop & code test plans & documentation. Perform software integration using object-oriented programming techniques. Qualified applicants must have proof of legal authority to work permanently in the U.S. and should send 2 copies of resume & verification of requ. to: Illinois Department of Employment Security, 401 S. State St. - 8 South, Chicago, IL 60605, Attn: Sheila Lindsey. Ref. #V-IL 11480-L. No calls. Employer paid ad.

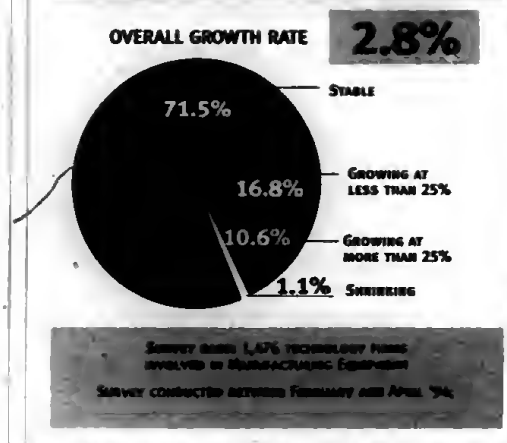
LC. Designers: Develop functional models from an architectural specification of RISC microprocessor integrated circuits including memory management unit and peripherals; schematic capture, logic and circuit design, layout, verification of design including logic and circuit simulations; development of assembly and C language code for testing and verification of RISC microprocessor based systems. University level training, research background or experience in the following: RISC and multiprocessor architectures; computer design methodologies; design and simulation of digital CMOS VLSI circuits; logic design of combinational and sequential circuits; CAD tools for VLSI design; operating system principles and techniques; microprocessor based design methodologies; UNIX/C and assembly level programming. MS/Electrical or Computer Engineering / Salary: $3,500/mo. / Job Location/Attn: Austin, Texas / Clip this ad and send with resume to: Attn: M. Mehta, 5316 Highway 290 W, Suite 500, Austin, TX 78735.

• AGS • AIC • AMGEN • AT&T • Arizona Department of Transportation • Abacus Consultants • Adept • Aerotek • Aetna • Alamo Rent-A-Car • Alaska Airlines • Alco Health Services • Aldus • Allied Signal • Amdahl • American Management Systems • American Airlines • American Cyanamid • American Express • American Heart Association • American List Council • American Red Cross • Ameritech Information Systems • Amway • Anatec • Andersen Consulting • Apple Computer • Atlanta High Tech Career Fair • Ball State University • Bank of America • Barnett Technologies • Baxter Healthcare • Bell South • Bentley College • Blue Cross Blue Shield • Booz Allen Hamilton • Brannon & Tully • Bridgestone Software • Broadway & Seymour • Brown Brothers Herriman • Broyhill Furniture • CAP Gemini America • CPU • CSC Partners • Computer Task Group • Capricorn Systems • Career Fair Coordinators • Carolina Power & Light • Cellular One • Central Maine Power • Charles Schwab • Chicago Board of Trade • Ciber • Circuit City • Citicorp • Claremont Consulting • Coca-Cola • Comdisco • Computer Horizons • Computerworld • Compuware • Coopers & Lybrand • Coors Brewing • Covia/United Airlines • Cray Research • D&B Software • DHL • Deloitte & Touche • Digital • Dow Jones • Dun & Bradstreet • E-Systems • EDS • ESPN • Eckerd Drug • Eddie Bauer • Eli Lilly • Emery Worldwide • Equifax • Ernst & Young • Esprit Systems • Executive Life • Federal Express • Federal Reserve Bank • Fidelity Investments • First Chicago • Florida Power & Light • G Heileman Brewing • GE Consulting • GLAXO • GTE • Gallo Winery • Gartner Group • General Mills • Gulfstream Aerospace • HBO • Harris • Hayes Microcomputer • Haldock & Struggles • Hewlett-Packard • Hill & Knowlton • Holiday Inn • Hyatt Technical Center • IBM • Informix • Ingres • Intel • Interactive Business Systems • Intergraph • Interleaf • Internet • Intuit • Johnson Controls • Kaiser Permanente • Keane • Kemper • Knowledgewere • Legent • Logica • Lotus • MIT • Marriott • Mastercard International • Maybelline • Melita • Mellon Bank • Memorex • Metropolitan Life • MicroFocus • Microsoft • Morgen Stanley • Nationsbank • National Computer Associates • National Education Training Group • Nellie Mae • Nestle • Nike • Nissan • Northern Trust • Northrop • Novell • Oracle • Packard Bell • Parot Systems • Powersoft • Price Waterhouse • Primerica • QVC Network •

America's Leading Corporations Advertise Their IS Positions in Computerworld. Shouldn't You?

CAREER SURVEY: Manufacturing Equipment

INDUSTRY HIRING TRENDS

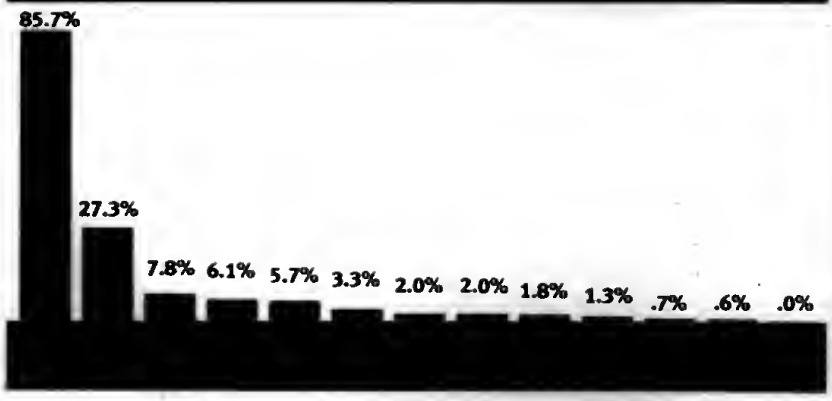


Survey data: 1,675 technology firms involved in manufacturing equipment

Survey conducted between February and April '94

© Copyright 1993, Corporate Technology Information Services, Inc., Woburn, Mass.

REGIONAL GROWTH ANALYSIS



CORPTECH, A DIRECTORY PUBLISHER IN WOBURN, MASS., TRACKS THE U.S.' 35,000 TECHNOLOGY MANUFACTURERS. THIS SURVEY RELATES TO THE 25,252 TRACKED FIRMS WITH FEWER THAN 1,000 EMPLOYEES.

VIRUS PROTECTION: AT YOUR SERVER

BY BRONWYN FRYER

In the 1960s bomb-scare movie "Dr. Strangelove," General Jack Ripper claims that "war is too important to be left to the politicians." In the war against computer viruses, systems administrators are beginning to adopt a similar dictum: Antivirus protection is too important to be left to the users.

For this reason, the hottest thing in antivirus protection is server-based software. Designed as Novell, Inc.'s NetWare Loadable Modules (NLM) for NetWare networks, this class of protection offers two obvious benefits over stand-alone PC products: They protect the network server and user machines from lurking viruses, and users don't have to worry about protecting their systems.

While it is possible to run conventional antivirus packages on a server, NLMs are superior, says Mike Grayson, technical manager at Software Solutions Corp. in Dallas. "A NLM can do real-time scanning of incoming and outgoing files from the server. That's critical when you have a lot of users changing disks all day," he says.

Everyone in the virus arena is hopping onto the NLM bandwagon, says Robert Bales, executive director at the National Computer Security Association (NCSA) in Washington. "It's a more proactive approach to protection." However, in spite of its growing popularity, the number of players is diminishing, Bales says.

Larger companies such as Symantec Corp. — which recently signed agreements with Central Point Software, Inc. and Fifth Generation Systems, Inc. to merge the companies — and Intel Corp. are expected to gain leads. However, competition will continue from smaller vendors such as McAfee Associates, Inc. and Brightwork Development Corp.

Currently, all major NLM products are able to detect more than 1,000 viruses. The downside is that they risk slowing down network performance, especially on a heavily loaded server. Also, NLMs only operate with NetWare, therefore real-time, server-based protection of non-Novell networks is still impossible.

Putting such considerations aside, which products are best? It depends on your needs. "All are pretty good at catching viruses," Bales says. For that reason, integration with your network as well as administration capabilities and performance handling needs to be evaluated.

According to an NCSA evaluation of packages for NetWare servers, two products — Central Point's Anti-Virus for NetWare and Intel's LANDesk Virus Protect — offer the broadest function sets. However, users such as Mike Grayson point out that the real proof is not clear until a problem occurs. "You don't know if an antivirus software package is really going to work until you find a virus," Grayson says.

Grayson said he likes McAfee Associate's Netshield, citing the company's constant updates of its virus list as a prime reason. "When we used Symantec's Norton Anti-Virus on a file server, it located a nonexistent virus in a PKZip file," he recalls. "When we checked the file against the McAfee prodnet, we fonnd that the Norton product had incorrectly read a file."

Other than the primary criterion of virus scanning, handling and reporting capabilities, look for features such as NetWare compatibility and a friendly administrator interface that supports remote administration. Experts also suggest finding a product that immediately warns the network manager when a virus is found. ■

Fryer is a free-lance writer in Menlo Park, Calif.

Antivirus software features

	Central Point Software, Inc., Beaverton, Ore.	Cheyenne Software, Inc., Roslyn Heights, N.Y.	Command Software Systems, Inc., Jupiter, Fla.	Symantec Corp., Cupertino, Calif.	Intel Corp., Santa Clara, Calif.	McAfee Associates, Inc., Santa Clara, Calif.
	Anti-Virus for NetWare 2.0	InocuLAN 2.5	Net-Prot Professional 1.24	Norton Anti-Virus for NetWare 1.0	LANDesk Virus Protect 2.1	NetShield 1.60
	$1,199	$495. $995	$995	$995	$995	$595
	1	1	Unlimited	1	1	1

Where to find products

Because of the tightly integrated relationship that must be established between NLM and NetWare, Novell tests antivirus NLM products, then certifies them as NLMs. While a NetWare-certified product is important for quality assurance, certification is a slow process that not all vendors have gone through yet.

Alternatively, the NCSA offers a certification program that puts NLM products through the paces. Users can call the NCSA to verify NetWare certification and product capabilities at (717) 258-1816.

Virus researcher Patricia Hoffman also offers a $30 shareware program called VSUM, which includes information on every known virus as well as current antivirus products. The program can be downloaded by calling (408) 244-0813.

— Bronwyn Fryer

OS/2 Storage Solutions

Complete OS/2 Storage Solutions

Best Performance SCSI CD ROM
Super fast Chinon SCSI-2 double speed CD ROM with 256K cache. Out performs 3X & 4X drives.

MOBILE DISK for Home, Office & Travel
Compact parallel port drive plugs into desktop or notebook PC. Works like internal disk to add storage, exchange data and backups.

Unlimited Worry-Free OPTICAL DISK
The fastest 3.5" 230MB Fujitsu rewritable optical disk drive with lifetime warranty at less than 25¢ per MB for unlimited rugged & reliable storage.

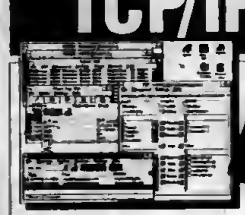
OS/2 VALUE PRICE OFFER!

Complete OS/2 Internal CD ROM Kit.....$ 398.
(Includes drive, cable, manual, Corel OS/2 software. Controller sold separately)
OS/2 Mobile Disk 340MB.....$ 499.
(Everything included. Call for higher capacities)
230MB Rewritable Optical Drive Kit.....$ 875.
(Includes drive, cable, manual, Corel OS/2 software. Controller sold separately)
230MB Optical Disk Media (Lifetime Warranty).....$ 55.

Value Star
FAX (408) 437-8333
1-800 873-VALU

Windows / Internetworking

TCP/IP for Windows



New Version! CHAMELEON 4.0
AUTOMATIC INSTALL OVER ODI OR NDIS

More Windows applications than any other TCP/IP package
NEW! Telnet Client TN5250
MIME S upport in Mail
100% DLL implementation
Requires only 6KB of base memory
Installs in 5 minutes

Applications:
Telnet (VT100, VT220, TVI), TN3270, TN5250, FTP, TFTP, SMTP Mail with MIME, News Reader, PROFS Mail, LPR/LPD, Ping, Bind, Finger, Whois, Gopher, Phonetag, Scripting, Statistics, Custom, SNMP Agent

Developer Tools:
Windows Socket API, Berkeley 4.3 Socket API, ONC RPC/XDR, WinSNMP API

For overnight delivery call:
NETMANAGE™
(408) 973-7171
10725 North De Anza Blvd., Cupertino, CA 95014 USA Fax (408) 257-6405

Computer Presentations

Bright color. Bright price.

$2,299.

The BOXLIGHT 1280 ColorShow Special.

SPECIAL OFFER!

The BOXLIGHT 1280 True Color Projection Panel. At $300 off, it's an unbeatable value.

- Brightest image
- Compact & portable
- PC & Mac
- FREE remote & cable

- The projection panel specialists
- More than 50 models in stock
- Instant availability
- Overnight shipping
- 30-day guarantee
- Technical support hotline

BOXLIGHT: Your direct source for all the bright answers.

No one else offers the one-stop shopping...the selection...the value...the immediate delivery...and the knowledgeable service and support you get from the projection panel experts.

BOXLIGHT

Business Opportunities

We Seek Strong Local and Regional Partners for Large System Integration and Development Projects

Successful integrator and system houses know and understand their own marketplace. But too often the really big technology jobs in their own backyards go to the big firms with the muscle to execute the complex, multi-million dollar projects

The playing field is about to be made level. This summer, the best and most sophisticated Israeli project integrators will be coming to the U.S. to form alliances with local firms. The concept behind this initiative is simple.

At any given moment, teams of Israeli integrators are working both on-site around the world and in Israel on large-scale technology projects. The requirements of these jobs are as diverse as a census systems for an Eastern European Government . . . the complete back-room processing system for a large Pacific Rim bank . . . or the integration of diverse and non-compatible systems into an enterprise wide solution for a company with thousands of remote sites.

These Israeli firms now want to bring these talents to the U.S. by forming alliances and partnering relationships on a region by region basis across the country.

In July, the Managing Directors of three large Israeli technology companies will be visiting the U.S. to demonstrate and discuss their expertise in the areas of:

- total systems design
- right-sizing
- custom programming (any language/platform)
- platform migration
- re-engineering
- complex real-time applications
- client server solutions
- telecommunications
- total technology implementation
- specific vertical expertise (banking, MRP, healthcare, simulators, etc.)

If your firm has annual revenues of at least $5 million, and has a strong reference base of satisfied clients, call to schedule an appointment in one of the cities where the Israeli corporations will be discussing their vision and technical know-how.

For more information regarding these exploratory meetings, and the details regarding the, dates, times, and cities, contact the individual at the phone or fax number listed below.

This advertisement is intended to create partnerships and alliances rather than employment opportunities.

Michael G. Eckstein
North American Computer Consultant for the Government of Israel
Phone 215-525-3634 / FAX 215-526-2768

Outsourcing Remote Computing

Your best choice for mainframe computing services.

REMOTE COMPUTING

Extensive Software Library

Telenet Tymnet
Advantis Compuserve

MVS/ESA IMS/DBDC
VM/ESA CICS SAS
VSE/ESA TSO DB2

Extraordinary Customer Service
Migration Management

708-574-3636
New England 617-595-8000
815 Commerce Drive, Oak Brook, IL 60521

FANEUIL SYSTEMS

Outsourcing

Not sure if *OUTSOURCING* is for you?

TBI will help you determine how outsourcing can benefit your organization. We'll educate your team on the entire outsourcing process and objectively evaluate your business environment. TBI stays with you from start to finish. Our outsourcing specific methodologies, vendor evaluation models, and bid management techniques will help you keep control of the process. We offer full support for datacenter, application and network outsourcing needs. Call to learn how TBI's no-risk assistance can result in successful outsourcing.

Satisfying Fortune 500 clients nationwide for over 25 years!

TBI 800-676-9470

Technology & Business Integrators, Inc.

TBI TBI TBI

Outsourcing Remote Computing

ALICOMP, INC.

The "Boutique" of the Computer Services World

Outsourcing Remote Computing

VM, MVS, VSE

Two State of the Art Locations:

ALICOMP / CBS

20,000 sq. ft. Manhattan complex 105,000 sq. ft. Secaucus, NJ complex

"Our Platform is Excellence"

Serving Clients Since 1980

(212) 886-3600 • (800) 274-5556

Outsourcing

If Outsourcing is your objective...

You can maximize your information technology investment by outsourcing part – or all – of your IS operation. Whether it's a transitional or long-term total services partnership, American Software's the right place to rightsize.

Even software developers enjoy the cost and time-saving benefits of outsourcing with us. Call today and we'll tell you why.

® The Outsourcing Group
A Unit of American Software USA
470 E. Paces Ferry Road
Atlanta, GA 30305
404-264-5770

MARKETPLACE

Computer Products

NC3

IBM, COMPAQ, APPLE...They bring you the technology, We make it AFFORDABLE!
The New To You™ Technology Company

COMPUTERS

IBM

PS/2 8556-C21	$575
PS/2 8556-M71	$575
PS/2 8556-M91	$575/$700
PS/2 8535-A40	$650/$695/$810
PS/2 8555-031/031	$599/$699
PS/2 8557-A55	$800
PS/2 8567-200	$1,095
PS/2 8570-031	$690
PS/2 8570-121	$675
PS/2 8580-111	$675
PS/2 8590-OH9	$1,595
PS/2 8590-OK9	$2,195
PS/2 8595-OK9	$2,695
PS/2 8595-OH9	$1,895
New VALUEPOINT Box-in stock	Most models CALL!

APPLE

Mac SE 20	$375
Mac IIcx	$795
Mac IIsi	$765
Mac IIsi	$575
Mac Dvx	$1,345

COMPAQ

Power Pro Desktop	$795
Advantage Pro Desktop	$990
Advantage Pro Desktop	$1,450
Advantage Pro Desktop	$1,275
Advantage Pro LCD Desktop	$1,195
Premium Server EISA Tower	$2,195
Advantage Plus Mini Tower	
Compuvision 4865X/20	$700
Compuvision 4865X/20	$850
Laser 3065X/16	$575
Laser 3065X/25	$795

LAPTOP/NOTEBOOK/PORTABLE

AST (Remanufactured by AST in original AST Cartons)

Power Exec 4865/25/4MB/200MHD/Mono	$1,049
Explorer 486SX/25/4MB/170MHD/Mono	$1,750
Bravo 486SX/25/4MB/170MHD/Mono	$1,640
Advantage 386SX/25/2MB/60MHD/Mono	$949
Power Exec 386SL/25/2MB/80MHD/Mono	$1,149
Power Exec 386SL/25/4MB/170MHD/Mono	$1,299
Power Exec 386SL/25/4MB/60/80/120MHD/Mono	$1,199/$1,299/$1,449
Power Exec 386SX/25/4MB/120/160MHD/Passive Color	$1,599/$1,699
Advantage 386SX/25/4MB/60MHD/Mono	$1,045

TOSHIBA

T1200/386SL/40MhzV640K/720K FI/20MBHD/2400 bd modem/battery & charger/carrying case ✔	$595

IBM

8573-400	$2,175
8573-121	$895

COMPAQ

MISC ACCESSORIES/PARTS

Laptop/Notebook carrying cases (New)	$39
5.25" 1.2MB External Floppy II Cables ✔	$75
Mitsubishi Numeric Co-processors (New)	CALL!
Intel 80387/33Mhz Co-processors (New)	CALL!
IBM PS/2 Keyboard Cables	$6
IBM Compatible 101 Keyboards (New)	$34

✔=Factory Remanufactured

PRINTERS

APPLE

LaserWriter Select 310/Postscript (New)	$865
Personal LaserWriter LS w/Accessory Kit (New)	$499
LaserWriter II ✔	$890
Imagewriter II ✔	$275
Stylewriter Laser Quality/ 5 ppm/ 360 dpi (New)	$295
Seikosha SP-2415AP 9 pin/150 cps w/push tractor (New)	$295

IBM COMPATIBLE

HP Laserjet III 8 ppm/1MB RAM ✔	$950
IBM 4029-040 Laser 10L/10ppm/300dpi/1MB/Network Version (New)	$960
IBM 4202-002 Proprinter II XL/9 pin/200/240cps/wide carriage ✔	$150
IBM 4212-001 24 pin/192/64 cps narrow Carriage ✔	$195
Seikosha ICS-3005 9 pin/300 cps/wide carriage (New)	$295
Olivetti OM6805 328 cps dot matrix/wide carriage (New)	$295

MONITORS

IBM

6314-001	$345
8511-001	$265
8512-001	$165
8513-001	$175
8514-001	$275
8515-001	$275
8507-001	$295

One OIS Parkway, P.O. Box 4785, Syracuse, New York 13221-4785
Ph (315) 438-4400, Fax (315) 438-4213

We Buy Excess inventories!
Save/Up between 30-90% every day.
Fax Excess Inventory Lists to NC³ Inc. at 315/438-4213

Connectivity Software

BW-Connect NFS Server

Turns your DOS or Windows PC into an NFS server.

Check out these well-balanced BW-Connect™ features:

- ✓ Gives DOS, Windows™ and UNIX® clients access to server attached disks, CD-ROMs and print resources.
- ✓ Full NFS functionality on any 386/486/Pentium™ platform.
- ✓ True peer-to-peer networked PCs with TCP/IP and NFS.
- ✓ NFS client and server functions run concurrently as Windows applications.
- ✓ Security features included.
- ✓ Remote NFS clients can browse for resources.
- ✓ First NFS File Server for DOS.
- ✓ Can be used along with NetWare.®
- ✓ $349 for a stand-alone version.
- ✓ $99 add-on to BW-Connect TCP/IP.

For FREE 30-day evaluation call 1-800-463-6637.

Let's Connect!™

Beame & Whiteside Software™

Trademarks are the property of their respective owners. Tel (919) 831-8989. Fax (919) 831-8990. ©1994 Beame & Whiteside Software, Inc. (5/2/94)

On The Info Hwy. With Carl & Fred™ by Blick

Computer Presentations

Power Tools for the Power Presenter

One stop shop for all major brands

For the latest in color projection panels and projectors call the experts in LCD technology. Your satisfaction guaranteed or your money back. Quick delivery via Fed-X or UPS.

Call for CATALOG 1 800 726 3599

Sunnelight DISPLAY SYSTEMS, INC.

101 The Embarcadero Ste. 100-A, San Francisco, CA 94105
Hours: 6:30 to 5:30 PST, 9:30 to 8:30 EST
VOICE: 415 772 5800 FAX: 415 986 3817

Security

Kablit™ Security **NOW!**

STOP COMPUTER THEFT

IN THE OFFICE — ON THE ROAD

- Secure Computer or Notebook to desk, table, etc.
- Lock disk drive — Protect Data
- Lifetime Guarantee

Quick and Easy to Install!
Compact — Lightweight!
Available For Macintosh Computers Too!

Products Security Provided by Master Lock

Order Now — 800-451-7592

Secure-It

10 Maple Court, East Longmeadow, MA 01028

The particular Master Lock Trademarks used are trademarks of the Master Lock Company and are used by Secure-It, Inc. under license.

MARKETPLACE

Training & Education

FREE PC TRAINING CATALOG

Why use one method to train your staff on Windows, DOS, Macintosh, UNIX or any other software application?

Our catalog includes hundreds of videos, software tutorials, multimedia and classroom courseware products... guaranteed to appeal to every type of learner.

Choose from more than 3000 products that will save you money on end user and systems training.
No personal or dealer inquiries

Call Elin today and see how we can help you maximize your training dollars.

800-363-5611

Elin Computer Resources, Inc.
100 Walnut Street, Champlain, NY 12919
Fax 514-483-1754 Int'l 514-483-4641

Related Marketplace Editorial Attracts Buyers to Your Ad - Every Week!

May 9: Wheeling and Dealing Negotiating Disaster Recovery Contracts

May 16: Buying Smart What To Expect from On-line Help Facilities

May 23: Hot New Tools A Compendium of Reader Recommendations

May 30: Buying Smart Investigating the "Gotchas" of PC Service Plans/Warranties - plus Perks Offered by PC Vendors

Computerworld Marketplace
1-800-343-6474, ext.744

Time / Services

Most Vendors
have well-equipped data centers...

They have large systems with the software you need, plenty of MIPS, and UPS systems.

ONLY ONE WILL EXCEED YOUR EXPECTATIONS!
- Only one runs your work as its own.
- Only one minimizes your risk and maximizes your cash flow.
- Only one will get the job done totally.

CSC CompuSource – dedicated to outsourcing since 1980.

YOU'RE IN CONTROL WHEN YOU PUT US IN CONTROL!

CSC

CSC CompuSource
A Unit of Computer Sciences Corporation

110 MacKenan Drive
Cary, North Carolina 27511
919.481.9341

Systems & Services

Dempsey: Where IBM® Quality Is Second Nature!

- RS/6000
- AS/400
- SERIES/1
- ES/9000
- PS/2 & VP

Sales & Rentals
- Processors
- Peripherals
- Upgrades

Dempsey BUSINESS SYSTEMS
16377 Beach Blvd., Suite 323 • Huntington Beach, CA 92648
(714) 847-8486 • FAX (714) 847-3149

IBM Authorized Distributor Products Integrator

Call Today for Pretested Equipment, Technical Assistance & Overnight Shipping!

(800) 888-2000

Large Systems Buy / Sell / Lease

Leasing Service Group

- HDS GX 8420-C " LEVEL (166 MIPS)
  512/512/96-32 ESCON
- HDS EX100 MLPF / ESA (88MIPS)
  512x80
- HDS 7390's A-28's & B2's DASD

AVAILABLE NOW FOR LEASE OR SALE!

Call Mark Mechanic
1-800-832-4664 x 3953
LDI Plaza -30033 Clemens Road, Westlake, Ohio 44145

DDA MAKES A WORLD OF DIFFERENCE

and here's why... *Call 800-332-1130*

IF YOU'RE A USER
- Keeping report card on Digital-related businesses
- Setting standards for business practices & enforcing them through an ethics committee
- Call today for a membership list!

IF YOU'RE A DEALER\VENDOR
- Creating opportunities for education & networking
- Providing vendors with a strong collective voice for dealing with major manufacturers
- Join today and let your voice be heard!

dda Digital Marketplace

DDA is a non-profit trade association serving the interests of the DEC industry & its users since 1982. It is comprised of independent companies, including VARs, OEMs, dealers & lessors, who provide Digital-related hardware, software & services.

Large Systems Computers & Peripherals

IBM
- ES/9000
- SERIES/1
- AS/400
- RS/6000
- SYSTEM/88
- ...and more!

New & Used
- Computers
- Peripherals
- Upgrades

Buy · Sell · Rent · Lease

SPECTRA
(800) 745-1233
(714) 970-7000 (714) 970-7095 Fax
Anaheim Corporate Center
5101 E. La Palma Ave., Second Floor
Anaheim, CA 92807

amdahl · Data General · digital · HEWLETT PACKARD · Prime · stratus · Sun · TANDEM · UNISYS · XEROX

Buy Sell Lease

BUY

and we sell it too!

HP 9000
Data General
RS/6000
Data Products
PC's Workstations
(617) 982-

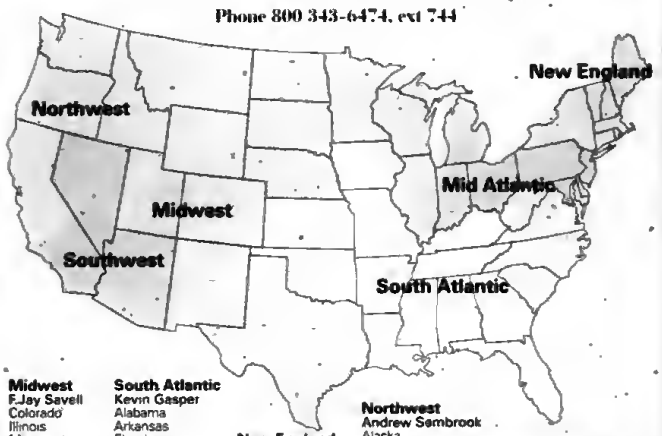
Associates Inc.

MARKETPLACE

COMPUTERWORLD Marketplace

Reach more buyers by stretching your ad budget with our charter rates! Your Computerworld Marketplace Account Executive has all the colorful details—call today

Phone 800 343-6474, ext 744



Midwest
F.Jay Savell
Colorado
Illinois
Minnesota
Montana
Nebraska
New Mexico
North Dakota
South Dakota
Texas
Utah
Wisconsin
Wyoming
Alberta
Manitoba
Saskatchewan

South Atlantic
Kevin Gasper
Alabama
Arkansas
Florida
Georgia
Iowa
Kansas
Kentucky
Louisiana
Mississippi
Missouri
North Carolina
Oklahoma
South Carolina
Tennessee
Virginia
West Virginia

New England
Susan Cardoza
Connecticut
Maine
Massachusetts
New Hampshire
New York
Rhode Island
Vermont
New Brunswick
Newfoundland
Ontario
Quebec

Northwest
Andrew Sembrook
Alaska
Idaho
Northern California
Oregon
Washington
British Columbia

Southwest
Claude Gerbarino
Arizona
Hawaii
Nevada
Southern California

Mid Atlantic
Michelle Reeves
Delaware
Indiana
Maryland
Michigan
New Jersey
New York City
Long Island
Ohio
Pennsylvania
Washington D.C.

Get Instant Access to – Computerworld Introducing . . . . . CW Online

Computerworld introduces CW Online, a comprehensive, fully searchable library of Computerworld articles. With CW Online, you can search the three most recent years of Computerworld issues. And the service is updated weekly, so you can access new information every week. Research has never been so easy, so complete or so economical. Right from your personal computer.

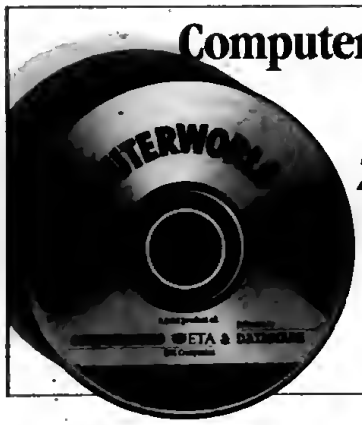
The Online start-up kit costs just $25.00 and includes everything you need to start using CW Online including easy-to-use communications software. After that, you'll be charged for access time along with a $5.00 monthly account service fee. You can even set your account up for us to bill your credit card or invoice your company on a monthly basis.

Call today to enter your subscription to CW Online and to receive your CW Online start-up kit with valuable communication software.

CW ONLINE Electronic access to a library of Computerworld articles

For more information or to order call
800-343-6474 x81-493 today.

Computerworld on CD



Search over 25,000 articles in 30 seconds from your desktop

COMPUTERWORLD, the weekly newspaper for information systems now brings you a valuable resource tool – COMPUTERWORLD on CD. With over 4 years of full text articles, you can use it to:

- Search comprehensive product and vendor information quickly.
- Follow critical technology trends.
- Execute key word searches on any topic in seconds.
- Eliminate mass paper storage.

Updated on a quarterly basis, a one year subscription is just $295. COMPUTERWORLD on CD operates on a PC (DOS and OS/2), Mac, Windows, and Sony Multimedia CD-ROM player environments.

To subscribe call: (800) 285-3821

COMPUTERWORLD
The Newspaper of IS

Helping You Target Buyers Is What We Do Best.

It's Our Business.

Computerworld Marketplace 1-800-343-6474, ext. 744

Bid / Proposals

REQUEST FOR PROPOSAL

R F P 0022

Jefferson Parish Department of General Services and Procurement is soliciting REQUEST FOR PROPOSAL'S (RFP'S) for AN AUTOMATED LOCAL GOVERNMENT FINANCIAL MANAGEMENT SYSTEM for the Department of Data Processing. RFP'S will be received in the Jefferson Parish Purchasing Department on June 20, 1994 until 3:00 P.M. local time. The Jefferson Parish Council reserves the right to accept or reject any and all proposals. Each proposal must be accompanied by a cashier's check, certified check, or surety bond of not more than 5% of the proposal. WHEN INDICATED IN SPECIFICATIONS.

Specifications are available gratis from
Jefferson Parish Purchasing 916 Courthouse Building
Second and Derbigny Streets Gretna, LA 70053

(Please request RFP 22)
All prospective Proposers will be notified of a Pre-Proposal Conference

Target Your Best Buyers Right Here! Get Wide-area Reach... Here!

Computerworld Marketplace
1-800-343-6474, ext. 744

Bid / Proposals

MS CENTRAL DATA PROCESSING AUTHORITY

Sealed proposals will be received by CDPA, 301 N. Lamar St., 301 Bldg., Suite 508, Jackson, MS 39201 for the following:

RFP 2681 due Wednesday, May 18, 1994 at 3:30 P.M. for the acquisition of a specialized multimedia laptop for Northeast Mississippi Community College. No Charge.

RFP 2682 due Tuesday, May 31, 1994 at 3:30 P.M. for the acquisition and implementation of a hand-held data collection hardware and software system for the Motor Carrier Division of the MS Public Service Commission. $10 Charge. For no charge RFP's, call (601) 359-2604.

For RFP's with a charge, a written request with payment enclosed is required. We will accept a corporate check on a MS bank, certified check or POSTAL MONEY ORDER made out to CDPA. No cash or out-of-state checks. CDPA reserves the right to reject any/all bids and to waive informalities.

401(k) ADMINISTRATION

DELTA DATA SERVICES, INC. ....
(800) 461-0166
Defined contribution administration software for the plan sponsor. Interfaces with payroll for administration of 401K, ESOP, thrift, and profit sharing plans. Daily or periodic processing, distributions, loans, ADP/ACP testing, user defined statements, voice response. Runs on AS/400. Client/server version available mid-1994.

4GL

CompuSolve Associates
River Edge, NJ .... **(800) 847-6583**

ACCTG SOFTWARE/SERVICES

Management Information Consulting, Inc.
Falls Church, VA .... (703) 845-5800

OPEN SYSTEMS® Accounting Software
Open Systems Holdings Corp. ...... (800) 326-2276

ACQUISITIONS - PUBLIC CO.

Looks to acquire contract programming companies.
Call confidentially .... (516) 437-3302

APPLICATIONS CONVERSION

Forecross Corporation
San Francisco, CA .... **(415) 543-1515**

APPLICATIONS DEVELOPMENT

AS-400/CICS/UNIX/Client-Server applications
AMPERSAND CORP. .... **(818) 546-9100**

CompuSolve Associates
River Edge, NJ .... **(800) 847-6583**

Impact Solutions, Inc., PC or Mac, Nationwide
Foxpro, Omnis, 4D Server .... (800) 858-8330

RESOURCE SOLUTIONS (800) 825-8884
CASEBASE V.4 makes application development selection or "shortlisting" a snap. 600+ products. Resource tool of choice for 5,000 developers on 4 continents. $195 (1yr) or $295 (2yr). 6050 Peachtree Parkway, Suite 340-228, Norcross, GA 30092

Micro Focus COBOL/CICS/XDB/DB2
SilverStone Systems, Inc. NY ... **(212) 786-4079**

SYNTEL, Inc.
NATIONWIDE .... (313) 828-3290

Planet Data/Paradox Windows Programming
Moriches, New York .... **(516) 878-6803**

CABLING SERVICES

Hi-Speed Printer Cables 30ft-200ft
Autotime Corp. .... (503) 452-8577

Nationwide, 250+ Local Service Locations
Premises One LAN SERV .... (800) LAN-SERV

CLIENT SERVER DEVELOPERS

Chen & Associates, Inc. ... **(800) 448-CHEN**
Downsizing from mainframe to Client/Server? Or, converting from one platform to another? Call the DBMS specialists. No job too small. Superior quality at great prices. Money back guarantee.

NIIT - Software Division .... **(404) 804-6446**
Developers of client server applications using Sybase and Oracle. Option for offshore software development available. For more information, contact us at 400 Perimeter Center Terrace, Suite 900, Atlanta, GA 30346. Fax: (404) 804-6445.

PowerCerv (PowerBuilder Specialists)
Tampa, FL (9 branch offices) ... **(813) 226-2378**

SYNTEL, Inc.
NATIONWIDE .... (313) 828-3290

CONSULTANTS

ADW & IEF & PowerBuilder Analyses & Design
Bridgton Consulting .... **(404) 933-8892**

FREE Technical Help on Oracle
DBA, SQL, Embedded SQL, Cobol under UNIX or MPE/iX. We may answer your short tech. question right on phone. Call 703-448-8484 Mon, Wed & Fri 6:30 to 9 PM EST. Better Fax 703-448-5639 (any time) before calling. Limited time offer.

CONTRACT PROGRAMMING

For your every computing need... We are a storehouse of talent in ORACLE 7.0, SYBASE, POWERBUILDER, UNIFACE, IBM (CICS, DB2, VSAM, COBOL), UNIX, WINDOWS, C, C++
Call us at **(617) 270-4848.**
Hexaware Infosystems Ltd.

INFORMIX/ORACLE/SYBASE/UNIX
ACJ & Associates .... **(800) 264-6686**

AS/400, RPG/400, S2K, PRISM, CUSTOM APPS
Skyrise Designs, Inc .... **(503) 382-4786**

SYNTEL, Inc.
NATIONWIDE .... (313) 828-3290

DATA CONVERSION

Data Conversion, Inc.
Minneapolis, MN .... (800) 927-0677

DBMS

CompuSolve Associates
River Edge, NJ .... **(800) 847-6583**

DISASTER RECOVERY

CHI/COR Information Management, Inc.
(312) 322-0150
Recovery Planning Made Easy. PC software tools guide network, data center, and business unit planning. Includes complete methodology to teach novices recovery planning concepts and relational database for easy planning. MS-Windows and LAN compatible

Raymond Professional Management, Inc.
Roswell, GA .... **(404) 587-4090**

Recovery Management, Inc.
REXSYS® Software .... **(800) RMI-5866**

Strohl Systems
LDRPS Software .... **(800) 634-2016**

EDUCATION & TRAINING

Object-Oriented Analysis & Design Training
aLigra Systems .... **(800) 347-6903**

IS Training Services **(508) 635-6616**
Specializing in technical and non-technical training solutions and educational consulting services designed to support the entire IS function – including the clients of IS. ***40+ years of experience!*** *Contact BoyTan & Associates,* 5 Old Meadow Lane, Acton, MA 01720.

Skill Dynamics, An IBM Company
A full service training company that specializes in technical and business training, consulting, outsourcing and customized offerings. Call 1800 IBM-TEACh for a free catalog.

LEARN C++ ONLINE: Instructor-led! Experiential format teaches basic C++. Participants complete a variety of tasks checking both conceptual & practical understanding and interact in teams to produce an automated library. Contact ISIM, 1-800-441-ISIM, Box 470640, Aurora, CO 80047

LAKEVIEW TECHNOLOGY INC
Instructor-led AS/400 education (800) 962-4081

MIS Training Institute (508) 879-7999
Audit & Security .... Fax(508) 872 1153

James Martin World Seminar
(312) 346-7090
Business Process Redesign and Enterprise Engineering in computer industry's most valuable seminar. Three days with Dr. James Martin that will change your professional life. Also, Software Reuse Engineering and Client/Server tutorials. Call for seminar dates and prices.

NIIT - Training Division ..... **(404) 804-6446**
Developers of custom Computer Based Training (CBT), Multimedia, and Performance Support Systems. Development site is ISO-9001 certified. For more information, contact us at 400 Perimeter Center Terrace, Suite 900, Atlanta, GA 30346. Fax (404) 804-6445

Object Oriented Preparation Services, Inc.
Robbinsville, NJ .... **(609) 259-0601**

Sybase, SQL Server Training
Larson Software .... **(800) 394-7966**

VISUAL BASIC Training
Texas Software Svcs .... (214) 404-1055

ELECT. DATA INTERCHANGE

Impact Int'l Technologies, Inc.
Princeton, NJ .... **(609) 734-7411**

EXECUTIVE INFO. SYSTEMS

XENOS Corporation
Dallas, TX .... (214) 869-9660

FAX-ON-DEMAND

"HOW TO PROFIT FROM FAX-ON-DEMAND"
Discover the power of automatic fax delivery of information for your organization. Get this manager's guide for only $29.95. For Table of Contents by fax, call 406-243-2275, request document #510.
ABConsultants **(800) 882-3718**

FOCUS

FOCAL SYSTEMS, INC. Focus Consulting
Seattle, WA .... (206) 788-4467

HELP DESK

PowerCerv (PowerBuilder Application)
Tampa, FL .... **(813) 226-2378**

HUMAN RESOURCE S/W

SPECTRUM Human Resource Systems Corporation
Denver, CO .... (800) 334-5660

HUMAN RESOURCE SYSTEMS

Ceridian Employer Services
Repertoire and HR-1 HRIS .... **(800) 729-7655**

IMAGING

Document Mgt, Workflow for AS/400
Acknowledge Inc. .... (800) 533-1776

ISO 9000 Doc. Mgmt. Systems
OXKO Corporation .... (410) 224-3314

MANUFACTURING SOFTWARE

Intrepid Software, Inc.
Burlington, MA .... (617) 273-2920

PowerCerv (PowerBuilder/Sybase Application)
Tampa, FL .... **(813) 226-2378**

MARKETING INFO. SYSTEMS

PowerCerv (PowerBuilder Application)
Tampa, FL .... **(813) 226-2378**

MEMORY

MEMORY CONVERSIONS DIP/SIP 30/72 SIMM
Autotime Corp .... (503) 452-8577

MICROFILM/MICROFICHE

COLD: Direct Attach for AS/400
Acknowledge Inc. .... (800) 533-1776

NEWTON CONSULTING

Avalon Engineering .... (617) 247-7668
Custom Newton Products and Solutions

OBJECT CLASS LIBRARY

MetaSolv Software, Inc.
(Powersoft CODE Partner) **(214) 239-0623 x104**

PowerCerv (PowerBuilder Object Library)
Tampa, FL .... **(813) 226-2378**

OBJECT ORIENTED DEV.

SYNTEL, Inc.
NATIONWIDE .... (313) 828-3290

R Systems, Inc., California ...... **(916) 631-1503**
Quality Software Developed in India **SAVE $!**

OFFSHORE SOFTWARE DEV.

We are organized to deliver... ORACLE, SYBASE, POWERBUILDER, UNIFACE, IBM/UNIX solutions. State-of-the-art software factory. Project references on request.
Call us at **(617) 270-4848.**
Hexaware Infosystems Ltd.
Boston • Bahrain • Dammam • Bombay

OFF-SITE SOFTWARE DEV.

AS-400/CICS/UNIX/Client-Server applications
AMPERSAND CORP. .... **(818) 546-9100**

OUTSOURCING

IBM MVS/ESA TIMESHARING
CICS DB2 IMS
Current IBM software releases. Specializing in outsourcing for software developers.
BOOLE & BABBAGE
COMPUTER SERVICES
(800) 22-BOOLE

OUTSOURCING/REMOTE COMPUTING
Let a company with 26 years of experience help you make the right outsourcing decisions! We are a nationwide consultant who will guide your assessment and vendor selection. We locate services on ALL platforms.
COMPUTER RESERVES, INC.
(800) 882-0966

MCRB Service Bureau, Inc.
3090 Computer Services ...... **(800) 941-MCRB**

SYNTEL, Inc.
NATIONWIDE .... (313) 828-3290

PAYROLL SYSTEMS

Ceridian Employer Services
Signature® P/R & Tax Filing .... **(800) 729-7655**

SPECTRUM Human Resource Systems Corporation
Denver, CO .... (800) 334-5660

PROJECT MANAGEMENT

Pitagorsky Consulting/Training
New York, NY .... (212) 696-9687

PURCHASING SOFTWARE

Commerce Software, Inc. (PurchaseSQL®)
Elmsford, NY .... **(800) 447-7172**

QPI® PURCHASING MANAGEMENT SYSTEM
Dynamic Software, Greer, SC .... (800) 627-1218

RIGHTSIZING

MCRB Service Bureau, Inc.
3090 Computer Services ...... **(800) 941-MCRB**

SECURITY

JANUS Software .... (800) TO-JANUS
MVS Security Audit Sftw & Info Security Consulting

Security Audits, Training and Consulting
NCSA is the leading source of computer security educational materials. We also conduct security audits, training and can help you develop security policies and procedures. Request our free 28-page security resource catalog.
National Computer Security Association
(717) 258-1816 **Fax (717) 243-8642**
75300.3557@compuserve.com

RSH Consulting, Inc.
Newton, MA .... (617) 969-9050

System 613, Inc.
RACF/Systems .... (914) 425-7758

VANGUARD Integrity Professionals
Security/Audit MVS Software .... (714) 939-0377

S/W INTERNATIONALIZATION

International Systems Design, Inc.
S/W Loclztn/overseas distrib ... **(415) 788-1812**

S/W QUALITY ASSURANCE

RESOURCE SOLUTIONS (800) 825-8884
SQABASE makes Quality Assurance software selection or "shortlisting" a snap. Developed for the Quality Assurance Institute (QAI). *Members buy directly from QAI.* $135 US Funds. 6050 Peachtree Parkway, Suite 340-228, Norcross, GA 30092

TELESERVICES

IBM Rochester TeleServices
Rochester MN .... (800) 365-4426 ext. 500

To list your Company so that Computerworld's readers can contact you directly, call 800/343-6474, x7744.

Computerworld Inc.

An IDG Company The World's Leader in Information Services on Information Technology

Publisher
Gary J. Beach
Computerworld Headquarters: 375 Cochituate Road P.O. Box 9171 Framingham, MA 01701 9171 Phone: 508-879-0700, FAX: 508-875-4394

Bill Laberis	Kevin McPherson	Matthew Smith	Steve Woit
Senior Vice-President Editorial	**Associate Publisher Senior Vice-President/Sales**	**Senior Vice-President Operations**	**Senior Vice-President Marketing**

PUBLISHER'S OFFICE: *Executive Assistant to the CEO/Publisher* Karen Elliott *Assistant to Associate Publisher*, Lois Beninati **SALES:** *Display Advertising Production Manager* Paula Wright, *Display Advertising Coordinators* Peggy Hennessy Lisa Tanner **SALES CLASSIFIED**: *Vice President Recruitment Advertising* John Corrigan *Recruitment Marketing Director* Derek E. Hulitzky, *Product Classified Sales Manager*, Connie Martin Kearns, *Solutions Directory*, Nancy Whittaker, *Classified Operations Director*, Cynthia Delany **MARKETING**: *Director, Marketing Communications* Mary Doyle, *Account Manager Marketing Communications* Elizabeth Phillips, *Manager Trade Show & Conventions*, Audrey Shohan, *Marketing Communications Project Manager*, Susan Thaxter, *Administrative Assistant*, Patty White **CIRCULATION**: *Vice-President Circulation*, Gail Odeneal, *Director of Circulation Management* Maureen Burke **PRODUCTION**: *Production Director* Christopher P. Cuoco, *Production Manager* Beverly Wolff

Sales Offices

Associate Publisher/Senior Vice-President/Sales
Kevin McPherson
Computerworld Headquarters: 375 Cochituate Road P.O. Box 9171 Framingham MA 01701 9171 Phone: 508 879-0700, FAX: 508-879-0446

Northeast

Vice-President Eastern Advertising Sales David Peterson, Senior District Managers Bill Cadigan, Sherry Driscoll, John Watts, Sales Assistants Alice Longley, Lisa Ikels, Tammy Grynewicz, 375 Cochituate Road, Box 9171, Framingham, MA 01701 9171 (508) 879 0700 FAX (508) 872-2915 TDD (800) 428 8244

Mid-Atlantic

Senior District Manager Fred LoSapio District Managers Paula D'Amico Rich Molden Sales Assistants: Susan Kusnic, Jean Dellarobba, Mack Center I, 365 West Passaic St. Rochelle Park, NJ 07662 (201) 587 0090 FAX (201) 712 9786 TDD (800) 208-0288

South Atlantic

Senior District Manager Bernie Hockswender. Sales Assistant Debra Brown, 1400 Lake Hearn Drive, Suite 330, Atlanta, GA 30319 (404) 394-0758 FAX (404) 255-5123 TDD (800) 449-4974

Midwest

District Manager Sharon R. O'Brien, Sales Assistant Denice Richards, 980 N. Michigan Avenue, Suite 1400, Chicago, IL 60611 (312) 214 3606 FAX (312) 214-4962

Southwest

Senior District Manager Darren Ford, Sales Assistant Brenda Shipman, 14651 Dallas Parkway Suite 304 Dallas, TX 75240 (214) 233-0882 FAX (214) 385-1003 TDD (800) 822-4918

Northern California

Vice-President Western Advertising Sales Richard Espinoza, Senior District Managers Ernie Chamberlain, Kaye Sharbrough, Linda Holbrook District Managers: Christine Corry, Elizabeth Coquet, West Coast Operations Manager Leticia Lehane, Executive Assistant Denise Hui, Sales Assistants Emily Gaytan, Connie Sanchez, Denise Garcia Andrea Zurek Jim Schott 500 Airport Boulevard Suite 400, Burlingame, CA 94010 (415) 347 0555 FAX (415) 347 8312 TDD (800) 900-3179

[illegible]

Southwestern Regional Manager Fran Cowen Sales Assistant Aileen Lim, 18800 MacArthur Blvd., Suite 500 Irvine, CA 92715 (714) 757-4121 FAX (714) 757-4124

Custom Publications

Boston: Vice President Larry Craven Director of Publishing Services Carolyn Novack, Sales Assistant Heidi Schubarthan, 375 Cochituate Road Box 9171 Framingham MA 01701 9171 (508) 879-0700 FAX (508) 879-0446

San Francisco: Sales Assistant Nikki Wilson 500 Airport Boulevard, Suite 400 Burlingame, CA 94010 (415) 347 0555 FAX (415) 347 8312

Client Server Journal

Sherry Driscoll, 375 Cochituate Rd. Box 9171, Framingham, MA 01701 9171 (508) 879-0700 FAX (508) 872 2915, Kaye Sharbrough 500 Airport Boulevard, Suite 400 Burlingame CA 94010 (415) 347 0555 FAX (415) 347-8312

Product Classified

Sales Manager Connie Martin Kearns New England Account Executive Susan Cardosi, Mid Atlantic Account Executive Michelle Reeves, South Atlantic Account Executive Kevin Hopper Midwest Account Executive Jay Savell Northwest Account Executive Andrew Sambrook, Southwest Account Executive Claude Garbarino, Solutions Directory Nancy Whittaker 375 Cochituate Rd Framingham MA 01701 9171 (800) 343 6474 FAX (508) 875 7202

Recruitment Advertising Sales Offices

Vice President Recruitment Advertising John Corrigan Marketing Director Derek E. Hulitzky, 375 Cochituate Rd., Framingham, MA 01701 9171 (800) 343-6474

New England: Regional Manager Nancy Percival, 375 Cochituate Rd Framingham MA 01701 9171 (800) 343-6474 Account Executive Karen Leslie (800) 343 6474

Mid-Atlantic: Regional Manager Marty Finn Mack Centre I, 365 West Passaic St. Rochelle Park, NJ 07662 (201) 587 0090 Account Executive Caryn Dlott (800) 343-6474 TDD (800) 208 0288

South-Atlantic: Regional Manager Katie Kress, 8304 Professional Hill Drive Fairfax VA 22031 (703) 573 4115, Sr. Account Executive Pauline Smith (800) 343 6474

Midwest: Regional Manager Pat Powers, 1011 East Touhy Avenue Suite 550 Des Plaines IL 60018 (708) 827-4433, Sr. Account Executive Ellen Cross (800) 343 6474 TDD (800) 227 9437

West: Regional Manager Barbara Murphy 2171 Campus Drive Ste 100 Irvine CA 92715 (714) 250-0164 Sr. Account Executive Christopher Glenn (800) 343 6474 TDD (800) 203 5667

Direct Response Cards

East: Account Manager Norma Tamburrino Mack Centre I 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587 0090

West: Regional Manager Barbara Murphy 2171 Campus Drive Ste 100 Irvine CA 92715 (714) 250-0164 Sr. Account Executive Christopher Glenn (800) 343 6474 TDD (800) 203 5667

IDG International Marketing Services

President Frank Cutitta Eastern Advertising Manager Veronique Lamarque 187 Oaks Road, Framingham MA 01701 (508) 879-0700 TDD (800) 233 6597

Western Advertising Manager Ginny Pohlman 190 Harbor Drive, Suite 213, Sausalito, CA 94965 (415) 331 7677 FAX (415) 331 0691

International Data Group

Patrick J. McGovern **Board Chairman**; Walter Boyd **President**; William P. Murphy **Vice President Finance**

Computerworld is a publication of International Data Group, the world's largest publisher of computer related information and the leading global provider of information services on information technology. International Data Group publishes over 194 computer publications in 62 countries. Forty million people read one or more International Data Group publications each month. International Data Group's publications include: ARGENTINA'S Computerworld Argentina, Infoworld Argentina; ASIA'S Computerworld Hong Kong, PC World Hong Kong, Computerworld Southeast Asia, PC World Singapore, Computerworld Malaysia, PC World Malaysia; AUSTRALIA'S Computerworld Australia, Australian PC World, Australian Macworld, Network World, Reseller, IDG Sources; AUSTRIA'S Computerwelt Oesterreich, PC Test; BRAZIL'S Computerworld, Mundo IBM, Mundo Unix, PC World, Publish; BULGARIA'S Computerworld Bulgaria, Ediworld, PC & Mac World Bulgaria; CANADA'S Direct Access, Graduate Computerworld, InfoCanada, Network World Canada; CHILE'S Computerworld Informatica; COLOMBIA'S Computerworld Colombia; CZECH REPUBLIC'S Computerworld, Elektronika, PC World; DENMARK'S CAD/CAM WORLD, Communications World, Computerworld Danmark, LOTUS World, Macintosh Produktkatalog, Macworld Danmark, PC World Danmark, PC World Produktguide, Windows World; ECUADOR'S PC World; EGYPT'S Computerworld (CW) Middle East, PC World Middle East; FINLAND'S MikroPC, Tietoviikko, Tietoverkko; FRANCE'S Distributique, GOLDEN MAC, InfoPC, Languages & Systems, Le Guide du Monde Informatique, Le Monde Informatique, Telecoms & Reseaux; GERMANY'S Computerwoche, Computerwoche Focus, Computerwoche Extra, Computerwoche Karriere, Information Management, Macwelt, Netzwelt, PC Welt, PC Woche, Publish, Unit; [illegible]

- -

Have a Problem With Your Computerworld Subscription?

We want to solve it to your complete satisfaction, and we want to do it fast. Please write to
COMPUTERWORLD, P.O. Box 2043, Marion, Ohio 43305-2043.
Your magazine subscription label is a valuable source of information for you and us. You can help us by attaching your magazine label here, or copy your name, address, and coded line as it appears on your label. Send this along with your correspondence.

Address Changes or Other Changes to Your Subscription
All address changes, title changes, etc. should be accompanied by your address label, if possible, or by a copy of the information which appears on the label including the coded line. Please allow six weeks for processing time.

Your New Address Goes Here Address shown: ❑ Home ❑ Business

Name ____________________
Company ____________________
Address ____________________
City ____________ State ____________ Zip ____________

Name
Title **Company**
Address
City **State** **Zip**

Other Questions and Problems
It is better to write us concerning your problem and include the magazine label. Also, address changes are handled more efficiently by mail. However, should you need to reach us quickly the following toll-free number is available: **1-800-669-1002**
(Outside U.S. call (614) 382 3322)
CompuServe members can reach us at account number 75373, 1220

Advertisers' Index

Ameter	103
Apple Computer	22-23
BMC	72
Borland International	58, C4
Chipcom	C3
Cisco	9
Cleo Communications	82
Compaq Computer Corp.	60-61
Computer Associates	3
Corporate Software	20
CW Ancillary	74
CW Circulation	82
CW Custom Publications	78
CW Marketing	104-105
CW Marketplace	55
CW on CD	86
Data Products	10
DB Expo	54
DCI	58, 76
Dell	40, 86
Digital Equipment Corp.	84-85, 99
Gupta Corp.	109
Hewlett Packard	13, 24, 77
IBM	18-19, 32-33, 64-65
IBM Personal Software Products	50
Information Builders	17
Informix	106
Innovation Data Processing	7
IPL Systems	50
Knowledgeware	25, 66-67
Legent	28-29, 95
Lexmark	31
Lotus Development Corp.	56-57
Micro Focus	11
Microsoft	42, 43, 44, 45, 47
Northern Telecom	88-89
Novell	93
Object Application Awards	99
OpenVision	108
Oracle Corp.	5, 83
PeopleSoft	27
Progress Software	80
Proteon	62
SAS Institute	96-97
Stratus	21
SunConnect	86
Sun Microsystems	36-39
SunSoft	52-53
Unisys	48-49
Universal Data Systems	15
Windows World Open	79
Zenith Data Systems	70-71

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

Marketplace Advertisers' Index
Pages 121-126

Alicomp, Inc.	(800) 274-4054
American Software	(404) 264-5770
BL Associates	(617) 449-0084
Beame & Whiteside	(800) 463-4667
Benlight Corp.	(800) 765-8757
CSC Compuserve	(919) 431-8841
Dempsey Business Systems	(800) 828-2800
Elm Computer	(800) 343-5611
Funcall Systems	(703) 474-0830
LDI Corp.	(800) 438-4884 x8640
NCS	(313) 480-4400
NetManage Inc.	(408) 973-7171
Pacelight	(800) 738-3000
Secure It	(800) 451-7592
Spectra Equipment	(800) 745-1200
TRI	(800) 876-8470
Technology Connections	(215) 385-8004
ValuStar	(800) 873-VALU

Companies in this issue

Page number refers to page on which story begins

3Com Corp. 20

X

Aberdeen Group 1
Acer America Corp. 12
Advanced Logic Research, Inc. 12
Advanced Micro Devices, Inc. 30,43
Advanced Modular Solutions 128
Advanced Visual Data, Inc. 65
Aldus Corp. 30
Amdahl Corp. 8
American Airlines 1
American Express Co. 111
Annex Research, Inc. 6
Aon Specialty Group 7
Apple Computer, Inc. 15,44,58
The ASK Group, Inc. 75
Association for Computing Machinery 1
AST Research, Inc. 12,41,44
AT&T Corp. 1,8,20,128
AT&T Bell Laboratories 51
AT&T Global Information Solutions 75
Atlantic Systems Guild, Inc. 107
Autodesk, Inc. 30
Automatic Data Processing, Inc. 73
AutoTester, Inc. 82

B

Bankers Trust Co. 1
Banyan Systems, Inc. 20,69
Bell Atlantic Corp. 8,16
Bell Atlantic Mobile Systems 16
Beyond, Inc. 69
BIS Strategic Decisions 43,51
Blue Cross/Blue Shield 64
BMC Software, Inc. 1
Borland International, Inc. 4,30,45,113
Boston Edison Co. 69
Boston Software Works 63
Brandywine Network Associates 41
Brightwork Development Corp. 121
British Gas PLC 24
Burton Group 128
Business Objects, Inc. 82
Business Software Alliance 8
BW/IP International 6

C

Cable & Wireless, Inc. 81
Cabletron Systems, Inc. 1,63
Carnegie Mellon University 12,73,75
Central Point Software, Inc. 12,121
Charles Schwab & Co. 73
Chase Manhattan Bank NA 1
Chipcom Corp. 1
Cincinnati Bell Information Systems 108
Cirque Corp. 41
Cisco Systems, Inc. 20
Cohen/Gebler Associations, Inc. 98
Colgate-Palmolive Co. 8
Comdisco Disaster Recovery Service 75
Compaq Computer Corp. 7,12,41
Computer Associates International, Inc. 6,8,113
Computer Intelligence/InfoCorp 8
Control Data Systems, Inc. 8
Creative Networks, Inc. 69
Creative Strategies Research International, Inc. 41
Crocker National Bank 98
Cyrix Corp. 43

D

D-Link Systems 20
D. H. Brown Associates, Inc. 58
DataMost Corp. 46
Dataquest, Inc. 58
Defense Logistics Agency 1
Dell Computer Corp. 12
Deloitte & Touche 1
Delrina Corp. 16
Delta Air Lines, Inc. 128
Digital Equipment Corp. 4,8,20,44, 91,98,128
Douglas Aircraft Co. 91
Dun & Bradstreet Software 76

E

Edward D. Jones & Co. 73
Electronic Data Systems Corp. 128
EMC Corp. 1,73,75,78
Enterprise Software Corp. 65
Entex Information Services 12
Excalibur Technologies Corp. 128
Expert Software, Inc. 46
Extension Technology Corp 65

F

FHP HealthCare, Inc. 69
Fifth Generation Systems, Inc. 121
Fleet Services Corp 1
FlexiWare Corp. 78
Fore Systems, Inc. 20
Forex Computer Corp 12
Forrester Research, Inc. 76
Fox Television Stations, Inc. 91
Frank Russell Co. 1
Frye Computer Systems, Inc. 65
Fujitsu Ltd. 8,51

G

Galactiromm, Inc. 64
Gandalf Technologies, Inc. 20
Gartner Group, Inc. 1,4,63,73,111
Gateway 2000, Inc. 7,12
Generic Software, Inc 78
Goldman, Sachs & Co. 73
Gradient Technologies, Inc. 75
Grand Junction Networks, Inc. 20
Gupta Corp. 24,82

H

Hallmark Cards 63
Hambrecht & Quist, Inc. 129
Harvard Medical School 91
Hayes Microcomputer Products, Inc. 16
Helene Curtis, Inc. 1
Hewlett-Packard Co. 8,20,41,44,51,58, 63,64,73,75,82,87,98
High Performance Systems, Inc. 42
Hitachi Ltd. 8
Hitachi Data Systems Corp 8,73
Holiday Inn Worldwide 44
Honeywell, Inc. 8
Hurwitz Consulting, Inc. 24

I

IBM 1,4,6,8,12,16,20,24,41,43,45,51, 58,63,65,73,75,78,82,87,91,98
IBM PC Co. 44
IEEE Computer Society 1
Image Club Graphics, Inc. 30
In-Stat Research, Inc. 43
Infonetics Research, Inc 63
Information Builders, Inc. 24
Informix Corp. 51
Institute for Certification of Computing Professionals 1
Intel Corp. 12,15,16,121,130
International Data Corp. 8,12,73,76,81
International Game Technology 6
Intersolv, Inc. 81
Intel Corp. 41,43,44,64
Isocor 63

J

James River Corp. 41
JetForm Corp. 16
JM Huber Corp. 1

K

Kaiser Permanente Health Plan, Inc. 8
Kansas City Southern Railway Co. 1
Kay Wholesale Drug Co. 6
Kemper Securities, Inc. 1
Kendall Square Research Corp. 30
Keyfile Corp. 51
Keyword Office Technologies Ltd 69
KnowledgePoint, Inc 45
Kuo & Associates 63
Kurzweil Applied Intelligence, Inc. 30

L

Lannet, Inc. 63
Lehman Brothers 73
Lexmark International, Inc. 45
Lotus Development Corp. 1,16,20,30 51,63,81,82

M

Market Trim Tabs 129
McAfee Associates, Inc 121
MCI Communications Corp. 1,16,51,82
Mead Data Central 73
Medex, Inc. 6
Media Magic, Inc 30
Media Vision 44
Mentor Graphics, Inc. 30
Mercury Research 43
Meredith Corp. 107
Merrill Lynch & Co 1
Meta Group, Inc 1,4
Metropolitan Museum of Art 15
Micro Express 45
Micron Computer, Inc 12
Microsoft Corp 1,4,6,12,20,24,30,41,45 51,63,81,82,87,113,128
Microsystems Software, Inc. 20
Midrange Opea
Business Strategies, Inc. 6

N

National Association of Communication Systems Engineers 1
National Computer Security Association 121
Neon Systems, Inc 82
New Jersey Institute of Technology 1
New York Life Insurance Co. 41
Nokia Display Products, Inc. 46
Nolan, Norton & Co 8
Novell, Inc. 1,4,15,20,30,41 51,64,65,69,128

O

Object Management Group 82
Objects, Inc 45
OK Industries, Inc 4
Omicron 1
Ontos, Inc. 51
Opti Computer, Inc 12
Optical Data Systems, Inc. 65
Optical Publishing Association 44
Oracle Corp 8,24,51

P

Pacific Bell 16,98
Pacific Gas & Electric Co. 51
Palm Computing, Inc. 46
Parallel Storage Solutions 45
ParcPlace Systems, Inc. 87
Patricia Seybold Group 1
Pennzoil Co. 81
PeopleSoft, Inc. 76
Pinnacle Micro, Inc 45
Pinnacle Publishing 113
Portrait Display Lab 44
Powersoft Corp. 82
Proteon, Inc. 20

Q

Q+E Software, Inc. 81

R

Radius, Inc. 44
RAM Mobile Data 128
Ray Dream, Inc 46
Recital Corp 113
Recognita Corporation of America 46
Recognition International, Inc. 51
Red Brick System 75
Resource Ltd 69
Rogue Wave Software, Inc. 87
Ryder System, Inc. 107

S

Sage Network Research, Inc. 1
Samtron Displays, Inc. 45
Schering-Plough Corp. 81
Scrivner, Inc. 43
Shapeware 41
Sharp Corp. 44
Shearson Lehman Brothers, Inc 1
Sheridan Software Systems, Inc. 87
SHL Systemhouse, Inc. 1,51
Silicon Graphics, Inc. 58
Smaby Group 111
Software Engineering Institute 1
Software Engineering of America 78
Software Productivity Research, Inc. 107,108
Software Solutions Corp. 121
Solomon R. Guggenheim Museum 41
Southern California Edison Co. 15
Sprint Corp. 8
Stac Electronics 12
Standard Microsystems Corp. 20
Stanford Linear Accelerator Center 98
Stanford University 73
Storage Technology Corp. 1
Sun Microsystems, Inc. 8,20,58,75,87
SunSoft, Inc. 4
Sybase, Inc. 1,51,76,78
Symantec Corp. 44
SynOptics Communications, Inc. 1,20
System Software Associates, Inc. 75

T

Taco Bell Corp. 15
Tandem Computers, Inc. 75
Tech Data, Inc. 12
Telco Systems, Inc. 65
Telecommunications Engineering, Inc. 16
Tellabs, Inc. 14
Teradata Corp. 24
Texaco Corp. 82
Texas Instruments, Inc. 12,16,43,51
The Boeing Co. 98
The Good Guys, Inc. 58
The Santa Cruz Operation 4
The Wollongong Group 65
TMS, Inc. 51
TouchStone Software Corp. 46
Transare Corp. 73,75
Transition Engineering, Inc. 78
Tribune Broadcasting Corp. 91

U

U.S. Department of Commerce 64
U.S. Department of Defense 8
U.S. General Services Administration 8
U.S. Shoe Corp. 108
Ungermann-Bass, Inc. 20,63
University of Massachusetts at Amherst 73
U.S. Robotics, Inc. 129

V

Van Camp Seafood Co. 6
Versant Object Technology Corp. 51,82
Viewstar Corp. 51
Volpe, Welty & Co. 61

W

Walker Richer & Quinn 65
Watermark Software, Inc. 51
Wellfleet Communications, Inc. 20
Wells Fargo Bank 73
Westl, Inc. 6
Weyerhaeuser Co. 76
WordPerfect Corp. 4,16,81
WorkGroup Technologies, Inc. 81

X

Xylogics, Inc. 65

Z

Zeos International Ltd. 12

Gainers Losers

Percent

Gainers		Losers	
Cray Computer	58.3	Gupta (L)	-32.2
Weitek (L)	32.5	Gateway 2000 Inc.	-22.0
Pinnacle Micro Inc.	20.4	4th Dimension	-18.3
Intuit Inc.	20.0	Cray Research Inc.	-17.4
Netrix Corp.	19.0	Advanced Logic Research	-14.6
Scientific Atlanta Inc.	18.8	Sapiens Intl. Corp. N.V. (L)	-13.2
Proteon Inc.	18.6	Mentor Graphics	-12.7
MicroAge Inc.	17.4	Centigram Communications	-13.6

Dollar

Gainers		Losers	
3COM Corp.	7.50	Gupta (L)	-7.25
Lotus Development	7.50	Cray Research Inc.	-4.50
Intuit Inc.	6.00	Gateway 2000 Inc.	-4.38
Scientific Atlanta Inc.	5.25	Autodesk Inc.	4.13
Xerox Corp.	4.25	Centigram Communications	-4.25
Xilinx	4.13	Progress Software Corp.	-2.75
MicroAge Inc.	3.75	Wall Data Inc.	-2.13
Stratus Computer Inc.	3.75	NetManage Inc.	-2.00

[redacted]

Modem fracas kicks up

The fur is starting to fly over U.S. Robotics, Inc. (USRX). The high-speed modem maker racked up solid earnings growth again in its recent quarterly results, but investment advisors are squabbling over where the stock is headed.

Market Trim Tabs, a publication based in Santa Rosa, Calif., recently recommended U.S. Robotics' stock as a "short," anticipating a drop in share price. (Short selling is a technique that yields a profit if the stock price goes down.)

According to ***Market Trim Tabs*** editor Charles Biderman, U.S. Robotics' inventory levels grew even faster than its revenue did last quarter. That means the company may have to take a charge against earnings in the future to write off excess products.

Biderman also said it is odd that U.S. Robotics' gross margins have grown while prices in the high-speed modem market have fallen precipitously.

U.S. Robotics Chief Financial Officer Ross Manire responded: "What they don't seem to bother to analyze is the fact that we are in a number of other business lines. Our other businesses have much higher margins and have provided some uplift. Also, our price moves have been tied to architectural changes and cost reductions."

Hambrecht & Quist, Inc. senior analyst Steven Levy said the company's inventory growth is sound and necessary. Levy said much of the inventory went into a new warehouse in Europe to support expansion efforts overseas. Levy further noted that the company needs to be ready to meet increased demand based on aggressive domestic price promotions.

So far, investors appear to be siding with the bulls. ***Market Trim Tabs'*** initial short recommendation (April 11) appeared with the stock at 32⅛ Wednesday the price stood above 33.

—Derek Slater

Steady as she goes

U.S. Robotics has managed year-over-year and sequential earnings growth for the past couple of years. The company's first fiscal quarter ends Dec. 31 of the previous calendar year.

Fiscal quarter	Earnings per share 1992	1993	1994
First quarter	0.22	0.30	0.46
Second quarter	0.24	0.31	0.49
Third quarter	0.26	0.36	NA
Fourth quarter	0.28	0.44	NA

NA: Not available

Exch	52-Week Range			Apr. 29 3 PM	Wk Net Change	Wk Pct Change
Communications and Network Services						**UP 3.3%**
OTC	63.75	13.63	3COM Corp	57.63	7.50	15.0
NYS	45.56	35.50	Ameritech Corp	39.75	-2.00	-4.8
NYS	65.00	49.50	AT&T	51.13	-1.50	2.9
OTC	26.50	12.50	Banyan Systems Inc.	17.50	1.13	6.9
NYS	69.13	48.00	Bell Atlantic Corp	52.00	-2.00	3.7
NYS	61.88	50.63	BellSouth Corp	81.25	0.13	0.2
NYS	21.50	4.38	Bolt, Beranek & Newman	11.75	-1.13	-8.7
OTC	15.75	9.50	Brooktrout Technology	13.75	0.38	2.8
NYS	133.50	86.60	Cabletron Systems	102.50	-1.50	-1.4
OTC	43.00	16.00	Centigram Communications	29.50	-4.25	13.6
OTC	40.25	12.25	Chipcom Corp.	46.25	0.25	0.5
OTC	80.75	30.00	Cisco Systems Inc	30.63	-0.63	-2.0
OTC	18.38	8.38	Compression Labs Inc	12.00	1.63	15.7
OTC	12.38	4.94	Computer Network Tech.	8.25	-0.13	-1.5
OTC	38.00	8.50	CrossComm	10.88	0.13	1.2
OTC	3.56	1.50	Data Switch Corp	2.13	0.13	6.3
OTC	73.13	33.25	DSC Communications	58.88	2.38	4.1
OTC	3.56	0.81	Gandalf Technologies Inc	1.13	0.00	0.0
NYS	17.63	8.00	General DataComm Inds.	12.75	1.75	15.8
NYS	39.88	29.50	GTE Corp	31.75	-0.63	1.9
NYS	95.97	73.88	ITT Corp	90.25	3.25	3.7
OTC	29.88	21.38	MCI Communications Corp (L)	32.81	-0.75	3.2
OTC	7.75	1.50	Microcom Inc.	5.63	-0.13	2.2
OTC	47.00	23.00	NetManage Inc.	33.50	-2.00	-5.6
OTC	7.25	3.50	Netrix Corp.	6.75	1.00	19.0
OTC	11.75	4.75	Network Computing Devices (L)	6.00	0.50	9.1
NYS	11.13	6.38	Network Equipment Tech.	8.13	-0.13	-1.5
OTC	23.38	8.00	Network General	18.38	1.38	8.1
OTC	10.13	6.38	Network Systems Corp. (L)	7.13	0.50	7.5
OTC	73.88	29.88	Newbridge Networks Corp	48.75	0.88	0.8
NYS	38.63	21.38	Northern Telecom Ltd	29.75	2.38	8.7
OTC	31.50	15.38	Novell Inc (L)	18.50	2.13	13.0
NYS	48.88	33.75	Nynex Corp	36.38	0.63	1.7
OTC	30.00	19.25	Octel Communications Corp	20.75	-1.50	-6.7
OTC	18.25	9.00	Optical Data Systems Inc.	16.00	-0.75	-4.5
OTC	7.50	3.75	Penril DataComm Networks	5.63	0.75	4.7
OTC	27.25	10.00	PictureTel Corp (L)	12.25	1.75	11.4
OTC	8.25	3.63	Proteon Inc.	8.38	1.00	18.6
OTC	14.38	7.00	Racotek Inc	9.00	0.00	0.0
NYS	38.88	29.88	Scientific Atlanta Inc	33.75	5.25	18.8
NYS	47.00	36.75	Southwestern Bell Corp	41.75	-1.38	-3.2
NYS	40.25	28.83	Sprint Corp	36.25	1.38	-3.7
OTC	26.75	13.75	Standard Microsystems Corp.	17.75	1.38	8.4
OTC	31.00	10.75	StrataCom Inc. (H)	22.88	0.88	4.0
OTC	42.75	18.50	SynOptics Communications (L)	20.25	0.50	2.5
OTC	15.25	2.69	Telebit Corp	11.00	-0.13	-2.1
OTC	46.00	20.25	US Robotics	32.75	0.31	1.0
NYS	50.75	38.50	U S West Inc.	41.25	2.00	-4.8
OTC	87.75	18.75	Wellfleet Communications	73.75	3.50	5.0
OTC	28.25	9.25	Xircom	22.38	0.88	4.0
OTC	50.00	13.75	Xyplex Inc.	15.25	0.25	1.8
PCs and Workstations						**OFF 2.09%**
OTC	7.50	2.63	Advanced Logic Research	5.13	-0.88	-14.6
OTC	59.13	22.00	Apple Computer Inc.	30.00	0.25	0.8
OTC	13.00	13.30	AST Research Inc.	17.75	0.00	0.0
NYS	112.00	43.11	Compaq Computer Corp (H)	110.50	2.63	2.4
OTC	34.38	33.50	Dell Computer Corp	22.38	1.00	-4.1
OTC	25.00	15.50	Gateway 2000 Inc.	15.50	-4.38	-22.0
NYS	93.63	64.38	Hewlett-Packard Co.	80.75	2.25	2.9
NYS	26.88	36.00	Silicon Graphics	25.00	1.13	4.7
OTC	32.63	20.88	Sun Microsystems Inc. (L)	22.25	-0.38	-1.7
NYS	50.75	28.11	Tandy Corp.	33.13	0.00	0.0
OTC	5.13	3.50	Zeos International Ltd.	3.13	0.25	8.7
Large Systems						**UP 3.08%**
ASE	7.88	6.38	Amdahl Corp (H)	6.63	0.63	4.6
NYS	7.63	3.63	Convex Computer	5.88	-0.63	-9.6
OTC	6.50	0.50	Cray Computer	1.44	0.50	58.3
NYS	33.75	20.38	Cray Research Inc.	21.38	-4.50	17.4
NYS	11.88	6.63	Data General Corp.	7.50	-0.50	7.1
NYS	48.25	18.25	Digital Equipment Corp. (L)	22.00	2.63	13.5
NYS	52.25	33.88	Harris Corp	63.63	0.25	0.6
NYS	60.00	40.63	IBM	57.13	-1.88	-3.2
OTC	25.75	2.75	Kendall Square Research	3.25	0.25	8.3
OTC	18.75	8.25	NetFrame (L)	11.75	1.25	11.8
OTC	26.00	6.25	Parallan Computer (L)	7.00	0.38	5.7
OTC	23.25	6.88	Pyramid Technology	8.25	0.25	3.1
OTC	23.25	11.13	Sequent Computer Sys. (L)	13.38	0.25	1.9
OTC	6.84	1.75	Sequoia Systems Inc.	5.00	-0.63	-11.1
NYS	41.25	20.25	Stratus Computer Inc	27.00	3.75	16.1
NYS	16.38	8.50	Tandem Computers Inc	11.63	-0.25	-2.1
OTC	30.00	10.75	TriCord Systems (L)	12.25	-0.88	-6.7
NYS	16.50	9.88	Unisys Corp.	10.88	-0.88	-7.4
Software						**UP 0.81%**
OTC	37.00	14.25	Adobe Systems Inc	26.50	1.50	6.0
OTC	34.50	13.50	Aldus Corp	29.00	1.75	6.4
OTC	8.88	5.00	American Software Inc.	5.13	-0.13	-2.4
OTC	15.75	6.75	ASK Computer Systems	8.00	0.50	5.9
OTC	61.75	37.00	Autodesk Inc.	51.39	-4.13	-7.8
OTC	4.50	2.38	Bachman Info. Systems	2.50	0.00	0.0
OTC	38.00	20.50	BGS Systems Inc	21.75	-0.88	-3.9
OTC	71.00	43.00	BMC Software Inc.	60.63	-0.38	-0.6
OTC	28.25	20.38	Boole & Babbage	27.00	1.44	5.6
OTC	27.75	11.38	Borland Int'l Inc. (L)	11.88	-0.13	-1.0
OTC	25.00	9.50	Bruce Control Systems Inc.	19.25	0.38	2.0
OTC	4.63	2.75	CE Software	3.25	-0.13	-3.7
ASE	30.34	16.91	Cheyenne Software Inc.	24.88	-1.63	-6.1
OTC	14.25	8.13	Cognos Inc	11.50	-0.38	-3.2
NYS	44.88	23.38	Computer Associates	32.50	2.25	7.4
NYS	5.38	2.13	Computervision Corp	4.00	0.50	14.3
OTC	48.75	21.00	Compuware Corp.	45.50	1.50	3.4
OTC	32.75	5.75	Comshare Inc.	11.00	0.25	2.3
OTC	22.00	7.00	Corel Corp	20.25	1.00	5.2
OTC	7.75	3.38	Easel Corp	4.25	0.25	-5.6
OTC	23.25	10.00	FileNet Corp	27.25	0.75	2.8
OTC	25.00	6.13	4th Dimension	6.13	-1.38	-18.3
OTC	12.50	5.25	Frame Technology	11.75	1.00	9.3
OTC	13.00	7.00	Group 1 Software	7.50	0.00	0.0
OTC	33.75	12.00	Gupta (L)	15.25	-7.25	-32.2
OTC	12.00	7.13	Hogan Systems Inc.	50.00	-0.13	-1.2
OTC	28.50	12.50	IMRS.	23.63	0.38	1.6
OTC	40.75	12.50	Information Resources	14.50	0.50	3.6
OTC	27.25	15.75	Informix Corp	16.63	0.13	0.8
OTC	32.38	8.50	Intergraph Corp.	9.50	0.00	0.0
OTC	8.75	4.88	Interleaf Inc.	6.88	0.50	7.8
OTC	15.50	4.75	Intersolv Inc.	11.00	-0.75	-6.0
OTC	50.00	25.75	Intuit Inc.	36.00	6.00	20.0
OTC	16.75	7.75	Knowledgeware Inc.	10.63	-3.38	-11.5
OTC	37.00	15.50	Legent Corp	31.25	3.00	10.6
OTC	86.50	25.50	Lotus Development	61.63	7.50	13.8
OTC	18.25	11.50	Magic Software Enterprises	13.25	0.25	1.9
OTC	18.50	6.75	Manugistics Group Inc	6.75	-0.75	-10.7
OTC	13.75	3.88	MathSoft	4.13	0.25	6.5
OTC	13.25	4.50	McAfee Associates	9.75	-0.50	5.0
OTC	17.25	8.38	Mentor Graphics	12.00	-1.75	-12.7
OTC	37.50	12.25	Micro Focus (L)	12.25	0.25	2.1
OTC	13.83	4.63	Micrografx Inc.	6.63	0.00	0.0
OTC	98.00	70.38	Microsoft Corp	92.75	1.75	1.9
OTC	37.75	17.69	Oracle Corp	29.88	-0.50	-1.6
OTC	64.75	23.73	Parametric Technology	36.38	0.38	1.1
OTC	24.50	17.00	ParcPlace Systems Inc. (L)	14.25	0.50	2.8
OTC	41.38	26.00	PeopleSoft	30.75	-2.00	-6.1
OTC	6.75	3.50	Phoenix Technologies	5.00	-0.44	-8.1
OTC	89.50	22.00	PowerSoft	54.00	2.25	4.3
OTC	39.75	3.50	Platinum Software	8.75	0.50	11.8
OTC	36.75	7.25	Platinum Technology	12.75	0.00	0.0
OTC	60.25	32.25	Progress Software Corp	44.50	-2.75	-5.8
OTC	3.81	1.94	Quarterdeck Office Sys.	2.63	0.38	16.7
OTC	32.00	10.25	Rainbow Technologies Inc. (L)	35.50	-0.25	1.0
OTC	11.38	4.00	RasterOps (L)	4.63	-0.13	2.6
OTC	14.38	3.75	Ross Systems (L)	5.13	-0.38	-6.8
OTC	28.75	9.88	Sapiens Intl. Corp. N.V. (L)	8.88	-1.50	-13.2
OTC	14.00	8.25	Softkey International Inc.	11.25	1.13	11.1
OTC	8.63	4.75	Software Publishing Corp. (L)	5.13	-0.19	-3.5
OTC	17.25	7.38	Software Toolworks Inc	14.50	-0.83	-0.2
OTC	13.75	6.25	State of the Art	7.50	0.25	3.4
NYS	35.63	17.63	Sterling Software Inc.	29.25	1.38	4.8
OTC	21.63	10.88	Structural Dynamics Research (L)	11.50	0.63	5.7
OTC	51.25	25.75	Sybase Inc	49.63	1.13	2.3
OTC	20.50	10.88	Symantec Corp.	15.63	1.13	7.8
OTC	32.75	33.75	SynOpsys	38.50	2.75	7.5
OTC	26.25	12.00	System Software Assoc.	16.00	0.50	3.2
OTC	6.75	2.88	[illegible] Corp	4.50	0.38	9.4
OTC	90.00	14.25	Viewlogic Systems	25.00	1.25	-4.8
OTC	13.75	5.50	Walker Interactive Systems	9.00	0.38	4.3
OTC	60.00	15.25	Wall Data Inc.	37.50	3.13	-5.4
Semiconductors						**UP 5.4%**
NYS	32.75	16.75	Advanced Micro Devices	28.25	0.75	2.9
NYS	33.35	17.88	Analog Devices Inc.	27.75	1.00	3.8
OTC	25.51	9.56	Atmel Corp	25.25	3.38	15.8
OTC	7.50	3.00	Chips and Technologies	4.63	-0.25	-5.1
OTC	64.83	15.75	Cirrus Logic	35.88	1.50	10.8
NYS	18.88	10.13	Cypress Semiconductor Corp	16.63	0.00	0.0
NYS	20.00	12.63	Dallas Semiconductor	18.25	-0.50	-2.7
OTC	37.50	19.75	Integrated Silicon Systems	26.00	0.88	3.8
OTC	74.50	67.50	Intel Corp	60.50	0.00	0.0
NYS	23.11	11.25	LSI Logic Corp (H)	22.38	2.38	13.8
OTC	26.75	12.25	Lattice Semiconductor	17.00	0.50	-3.0
NYS	39.81	9.19	Micron Technology	36.75	2.13	6.1
NYS	54.88	36.19	Motorola Inc.	46.50	1.88	-4.0
NYS	25.00	12.88	National Semiconductor	20.63	1.00	5.1
OTC	10.13	6.38	Sierra Semiconductor	8.50	0.75	8.7
NYS	89.50	55.75	Texas Instruments	70.25	3.25	4.3
OTC	18.88	6.63	VLSI Technology	13.81	0.44	3.3
OTC	14.38	4.63	Weitek (L)	6.63	1.63	32.5
ASE	20.38	3.63	Western Digital Corp	15.63	0.75	5.0
OTC	59.75	29.75	Xilinx	55.38	4.13	8.0
OTC	40.75	22.00	Zilog Inc.	33.13	2.38	8.3
Peripherals and Subsystems						**UP 3.68%**
OTC	30.50	13.88	American Power Conversion	22.50	0.25	1.1
OTC	24.75	12.13	BancTec Inc.	22.00	1.38	6.4
OTC	8.00	3.50	Cambex Corp	3.63	0.13	3.6
ASE	8.25	2.63	Cognitronics Corp (L)	2.88	-0.25	-8.0
NYS	20.50	8.00	Conner Peripherals	15.38	0.50	3.4
OTC	39.25	17.50	Creative Technologies Inc.	22.50	-1.50	-6.3
OTC	25.00	8.50	Data Race Inc.	7.25	-0.38	-4.9
ASE	11.63	6.13	Dataram Corp. (L)	5.00	0.50	11.1
NYS	23.00	7.50	EMC Corp.	17.38	-0.38	-2.1
OTC	8.25	3.13	Emulex Corp	4.00	0.50	13.0
OTC	21.00	14.25	Evans & Sutherland	16.25	-1.00	-5.8
OTC	22.50	7.50	Exabyte	19.50	1.63	8.1
OTC	34.00	7.50	Intelligent Info. Systems	8.25	-0.25	-2.9
OTC	5.13	2.00	Iomega Corp (L)	3.38	0.00	0.0
OTC	9.75	5.75	IPL Systems Inc (L)	6.00	-0.50	-7.7
OTC	28.50	13.75	Komag Inc	23.88	0.63	2.7
OTC	8.63	4.38	Maxtor Corp.	6.25	-0.13	-2.0
OTC	8.75	4.88	Micropolis Corp.	7.00	0.00	0.0
OTC	22.50	10.00	Pinnacle Micro Inc.	16.25	2.75	20.4
OTC	9.50	6.25	Printronix Inc.	8.75	-0.13	-1.5
NYS	16.38	7.38	QMS Inc (L)	8.00	0.63	8.5
OTC	20.25	9.38	Quantum Corp	17.88	1.88	11.7
OTC	9.13	3.13	Radius Inc	6.88	0.25	3.8
NYS	17.75	9.63	Recognition International (L)	10.00	-0.75	-7.0
OTC	8.88	3.63	Rexon Inc	6.75	0.63	11.1
OTC	28.75	14.38	Seagate Technology	26.38	1.83	7.4
NYS	45.00	23.75	Storage Technology	29.88	-1.00	-3.2
NYS	33.38	21.38	Tektronix Inc (H)	30.25	-1.50	-4.7
NYS	104.88	69.88	Xerox Corp	100.75	4.25	4.4
Services						**UP 1.12%**
OTC	22.38	14.88	American Mgmt. Systems	20.13	-0.38	-1.8
NYS	4.25	2.38	Anacomp Inc	3.88	0.13	3.3
OTC	23.50	16.50	Analysts Int'l	15.50	-0.25	-1.6
NYS	56.88	46.88	Auto Data Processing	51.50	1.63	3.3
OTC	18.75	7.50	Cambridge Tech. Partners	15.00	0.25	1.7
NYS	24.63	13.00	Ceridian Corp.	24.63	0.50	2.1
NYS	26.25	13.88	Comdisco Inc.	26.13	0.00	0.0
OTC	37.50	6.84	Computer Horizons	10.00	0.25	2.6
NYS	61.75	23.59	Computer Sciences	58.00	1.00	1.7
NYS	8.75	6.00	Computer Task Group	8.50	0.63	7.9
NYS	15.00	17.13	CompUSA Inc (L)	10.13	0.25	1.4
OTC	13.50	7.75	Control Data Systems Inc.	10.00	0.25	2.6
OTC	11.00	6.63	Egghead Discount Software	8.38	0.19	2.1
NYS	36.88	28.88	General Motors E (EDS)	33.75	-0.88	-2.5
OTC	22.75	11.13	Inacom Corp (L)	11.75	-1.25	-9.6
OTC	20.00	12.25	Intelligent Electronics	18.88	0.19	1.0
OTC	23.50	10.38	Merisel	17.44	0.50	3.3
OTC	32.50	8.50	MicroAge Inc.	25.25	3.75	17.4
OTC	40.50	23.84	Paychex	35.13	1.38	4.3
NYS	45.25	21.03	Policy Management Sys.	29.75	2.63	9.7
NYS	24.88	17.13	Reynolds and Reynolds	21.38	0.38	1.8
OTC	30.50	16.38	SEI Corp	23.25	0.50	2.2
OTC	29.38	17.50	Shared Medical Systems	35.44	-0.44	-1.2
OTC	12.63	5.81	SHL Systemhouse	6.63	0.00	0.0
OTC	30.75	13.50	Software Spectrum Inc.	13.88	-0.13	-0.9
OTC	42.75	28.00	SunGard Data Systems	37.15	3.13	8.3

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

Copyright Nordby International, Inc. Louisville, CO.
This information is based on sources believed to be reliable, and while extensive efforts are made to assure its accuracy, no guarantees can be made. Nordby International and Computerworld assume no liability for any inaccuracies. For information on Nordby International's Data-On Demand services for any of the above companies call Nordby International at (800) 926-7404.

Second-class postage paid at Framingham, Mass., and additional mailing offices. Posted under Canadian International Publication agreement [illegible]. Computerworld (ISSN 0010-4841) is published weekly, except a single combined issue for the last week in December and the first week in January by Computerworld, Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. Copyright 1994 by Computerworld, Inc. All rights reserved. Computerworld can be purchased on microfilm and microfiche through University Microfilms Inc. [illegible] Back issues, if available, may be purchased through the circulation department. Photocopy rights: permission to photocopy for internal or personal use is granted by Computerworld, Inc. for libraries and other users registered with the Copyright Clearance Center (CCC) [illegible] POSTMASTER: Send Form 3579 (Change of Address) to Computerworld, P.O. Box 2044, Marion, OH 43305.

Wysiwyg

Easter egg *(n.)*
1. A message hidden in the object code of a program as a joke. Many PCs have elaborate eggs hidden in read-only memory, including lists of developers' names, political exhortations, snatches of music and graphic images of development teams.

rain dance *(n.)*
Any ceremonial action taken to correct a hardware problem, with the expectation that nothing will be accomplished.
"I can't boot up the machine. We'll have to wait for Greg to do his rain dance."

sagan [from Carl Sagan's TV series "Cosmos"; think 'billions and billions']
(n.) A large quantity of anything.
"There's a sagan different ways to tweak Emacs."

Compiled by Lory Dix. Illustration by Dave Marshall

Brain-Dead Users

Once, I went up to a user who had blown her autoexec.bat, and I asked her for the diskettes on which she had been backing up her 60M-byte hard drive. She handed over one diskette. "Where," I asked, "are the rest?" She told me she found out that if she kept pressing Enter in response to the message asking for another diskette, the system would just pack the data tighter onto the current diskette.

Submitted by Laurie Holmes, senior programmer at Ellis County Data Center, Hays, Kan.

Tech Trivia

1. Agnes, Paul and Denise were the names of three custom chips inside which PC?
2. What is the name of the C program that Unix programmers use to examine a program for style, language, usage and portability problems?
3. In a video display, the acronym RGB stands for red, green, blue. What does HSB stand for?

Source: Top Computer Museum, Boston

Answers: 1. The Commodore Amiga. 2. Lint. 3. Hue, saturation, brightness

Great Names — **Richard Hardware**
Systems technician at SmithKline Beecham Corp.

What (humorous) spring cleaning advice would you give your vendors? Contact Lory Dix at (800) 343-6474, ext. 236 or CompuServe 76537,2413. If we use your idea, we'll send you a gift (but please leave a contact number)

Inside Lines

All warm and fuzzy

In late May at Database World, Excalibur Technologies Corp. will announce the unbundling of its fuzzy search engine — licensing modules to OEM customers. The modules will come in three flavors: An adaptive print matcher for fingerprints, an adaptive face matcher for faces and a forms recognition system and text search system. The face search application, which was demonstrated at the recent AIIM show in New York, allowed a still frame from a video clip to be captured and used as a search "term" for a 15-minute video clip.

About that ProShare premium . . .

Intel has been making the rounds with its H.320 version of ProShare, due out either late in the third quarter or early in the fourth quarter. One large customer briefed recently said Intel showed two prototypes: one was purely software, the other was a hardware/software combination. The software version ran like ooze, the customer said, but Intel wants as much as a 100% premium over its proprietary version of ProShare for the H.320 version with hardware compression. "We told them no way were we going to pay a premium for a product that's standard in the market," the customer said.

Pucker up for protocols

Microsoft is actually moving to embrace rival Novell's IPX as its own favored LAN transport protocol for Chicago and Daytona, according to Burton Group President Jamie Lewis. Microsoft will provide 32-bit IPX as the default LAN protocol for Chicago, with TCP/IP as the favored WAN protocol. Also, much faster versions of IPX and TCP are coming with the Daytona version of Windows NT, according to Lewis. "They've realized a lot of companies use IPX and that supporting it doesn't mean they are conceding anything to Novell."

Out on the Delta

Delta Air Lines said it expects to decide within 30 days whether to enter an "information technology services" venture with AT&T. Delta said it has eliminated Electronic Data Systems Corp. from its outsourcing evaluation. An agreement with AT&T could affect 1,500 information systems workers at Delta, which last week began a $2 billion corporatewide cost-cutting initiative in which it in will eliminate 15,000 jobs, representing 20% of its work force.

Milling around the mill

Former Digital CEO Ken Olsen has been spotted roaming the hallways of Advanced Modular Solutions in Acton, Mass., a start-up he helped fund. But Olsen has apparently been wandering on grounds closer to his heart — the Maynard, Mass., mill where he started Digital. He is said to be one of two parties bidding on the mill.

Biting the hand that feeds . . .

It ranks high on the irony list, but sources close to the U.S. Department of Justice said it is installing Microsoft Mail — all while it is embroiled in an antitrust investigation against "Big Green."

Count on the world's oldest profession to use some of the world's newest technology. A RAM Mobile Data salesman recently told us about the business manager for a group of prostitutes in Las Vegas who was interested in purchasing Hewlett-Packard palmtops using RadioMail's wireless two way E-mail running on RAM Mobile Data wireless networks. Presumably, the devices would be used to assign tasks to the mobile workers. Local bookies are also keen on using the wireless service to get news feeds faster. Speaking of faster, the best way to get in touch with Computerworld *about news items or tips is to call our 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News Editor Mary-Fran Johnson can be reached by phone at (508) 820-8179, via the Internet at mjohnson@cw.com or through MCI Mail at 590-8017.*

How to contact *Computerworld* editors:

	Phone:	Fax:
Main office, Framingham, Mass.	(508) 879-0700	(508) 875-8931
24-hour tip line	(508) 820-8555	
Mid-Atlantic bureau, Rochelle Park, N.J.	(201) 587-0090	(201) 712-1808
Washington bureau, Washington	(202) 347-0134	(202) 347-2365
Midwest bureau, Des Plaines, Ill.	(708) 827-4433	(708) 827-9159
West Coast bureau, Burlingame, Calif.	(415) 347-0555	(415) 347-6831
Northwest bureau, Bellevue, Wash.	(206) 641-7770	(206) 747-1021

☞ **Electronic mail:** *Computerworld*'s writers and editors have individual **MCI Mail** accounts. Most of our staff members can be reached on MCI Mail by addressing messages to their first and last names as they appear on the masthead, which is opposite the editorial page. For a complete list of editorial MCI Mail addresses, message Linda Gorgone at 597-8014.

☞ Our **CompuServe** account number is 76537,2413. Please use that account only for communications with writers and editors. Direct subscription inquiries to CompuServe: 73373,1230.

☞ **Letters to the editor** and other editorial-related messages can be sent via **Internet** to letters@cw.com

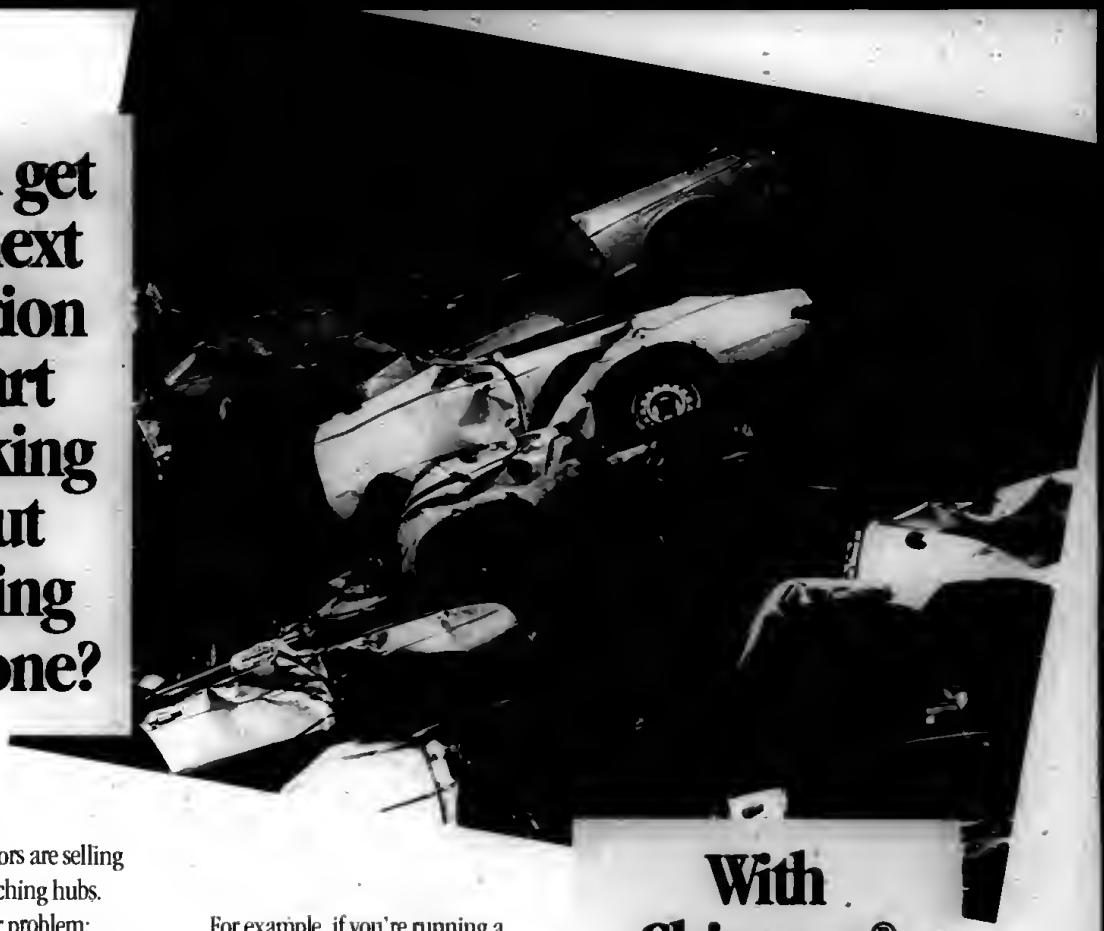
☞ **Client/Server Journal:** Contact Editor Alan Alper at (508) 820-8115 or via Internet at aalper@cw.com

☞ **Subscriptions:** Inquiries and changes of address should be sent to P.O. Box 2043, Marion, Ohio 43305-2403 or call (800) 669-1002.

☞ **Reprints:** Contact Sharon Bryant at (508) 820-8125.

☞ **Rapid Reference clipping service:** (800) 343-6474 x554.

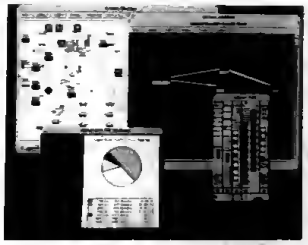
Can you get to the next generation of smart networking without scrapping the old one?



Right now, lots of vendors are selling next-generation smart switching hubs. But they all have one minor problem: What they sold you before won't work with their new technology.

With Chipcom, it's a different story.

Because to us, all this new technology is technology we pioneered years ago. We've been building switching hubs as long as we've been building hubs. So if your network has been built around Chipcom products, you've already bought a big chunk of its future. And whatever technology that future will require.



ONdemand™ NCS

For example, if you're running a network on our ONline™ System Concentrators, and you need to upgrade all or part of it to our next-generation ONcore™ Switching System, there's no problem. Every ONline module is completely upward-compatible. So not only do you save substantially by not scrapping your existing modules, you can upgrade where and as needed.

And unlike hub makers who grew up struggling with departmental LANs, vast enterprise-wide networks don't faze us. We started out building connectivity devices for huge networks, so we built scaleability and comprehensive network management into our architecture right from the start.

With Chipcom,® you can.

Call us at **1-800-228-9930** for complete information on the ONcore Switching System.

Or call us at the same number to inquire about Chipcom's worldwide seminar series on enterprise-wide networking. It's being held in more than 50 locations, so call to learn where and when we'll be in your region.

ONcore™

ONline™

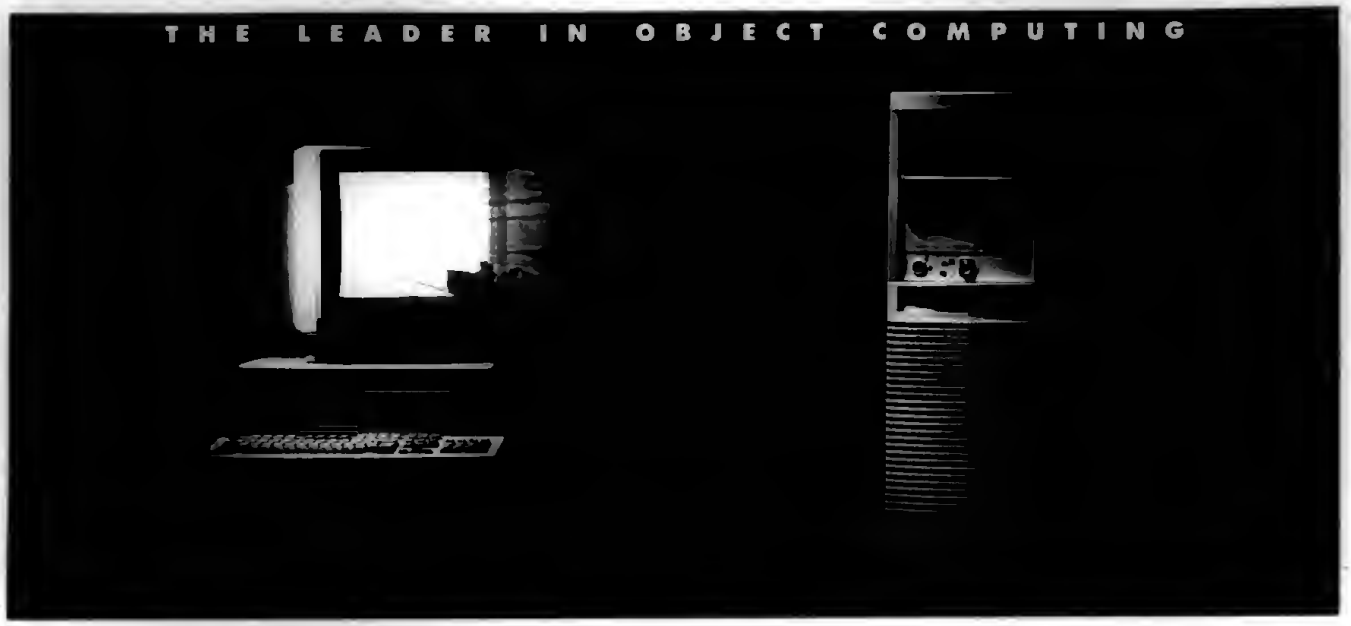
ONsemble™

SEE US AT INTEROP. BOOTH #3321

CHIPCOM™

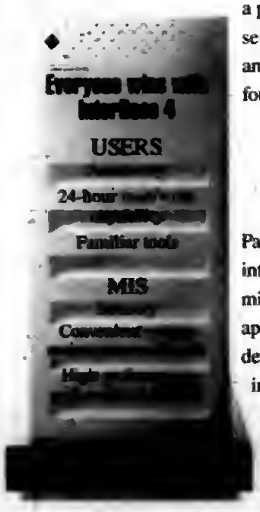
GS00K93AGS6439 The Chipcom logo ONcore ONdemand, ONline and ONsemble are trademarks and Chipcom is a registered trademark of the Chipcom Corporation © 1994 Chipcom Corporation Southborough Office Park, 118 Turnpike Road, Southborough, MA 01772
Chipcom U.S. Tel 508-460-8900 Chipcom Europe Tel. 44 (0) 494 764476 Chipcom ASEAN Tel 60-3-234-6212

THE LEADER IN OBJECT COMPUTING



Introducing Borland InterBase 4
The first upsizing server

Today, more business-critical applications are running on desktop systems than ever before. So the need to "upsize" these systems to client/server—for increased security, reliability, and information throughput—is greater than ever. That's why more companies are making the move to client/server with Borland InterBase 4. You get all the data integrity, security and performance of a powerful SQL database server, plus the reliability and ease of use normally found only in PC tools.



Leverage your existing code and knowledge

Paradox® data moves right into InterBase® with only minimal changes to your applications. Users and developers alike gain increased reliability and throughput, while continuing to work with their familiar tools.

And InterBase is so easy to manage. It's self-tuning, and can recover automatically from system failures without the use of log records. Add to that it's small footprint and "point-and-click" install, and you can see why this powerful RDBMS is the ideal SQL database server for deployment throughout your enterprise.

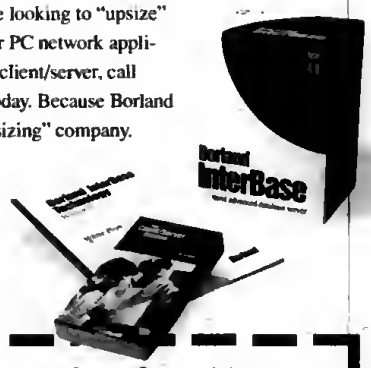
Fastest response in mixed read/write situations

Borland InterBase 4 is a powerful RDBMS that gives you features like multi-database joins, automatic two-phase commit, stored procedures and triggers. But the real secret to InterBase's performance is its unique versioning engine. It significantly reduces database locking by creating "difference" versions of records as they are changed. So you get the fastest response times in situations where users are both reading data from and writing to the database.

Users and MIS both win with InterBase

This is one SQL database server that doesn't force you to make trade-offs. End users get the freedom of data access they want while continuing to use their familiar tools. MIS enjoys enhanced security and the ability to maintain the system without having to take it off-line. And everyone benefits from the increased performance. No wonder customers like MCI and Money Store purchased more than 65,000 UNIX licenses for InterBase last year.

If you're looking to "upsize" your PC or PC network applications to client/server, call Borland today. Because Borland is the "upsizing" company.



Call today for a free videotape and technical white paper.

1-800-890-2223, ext. 8382

Borland

Power made easy™

Copyright © 1994 Borland International, Inc. All rights reserved. All Borland product names are trademarks of Borland International, Inc. BI 6908